



Evaluation of Utterslev School

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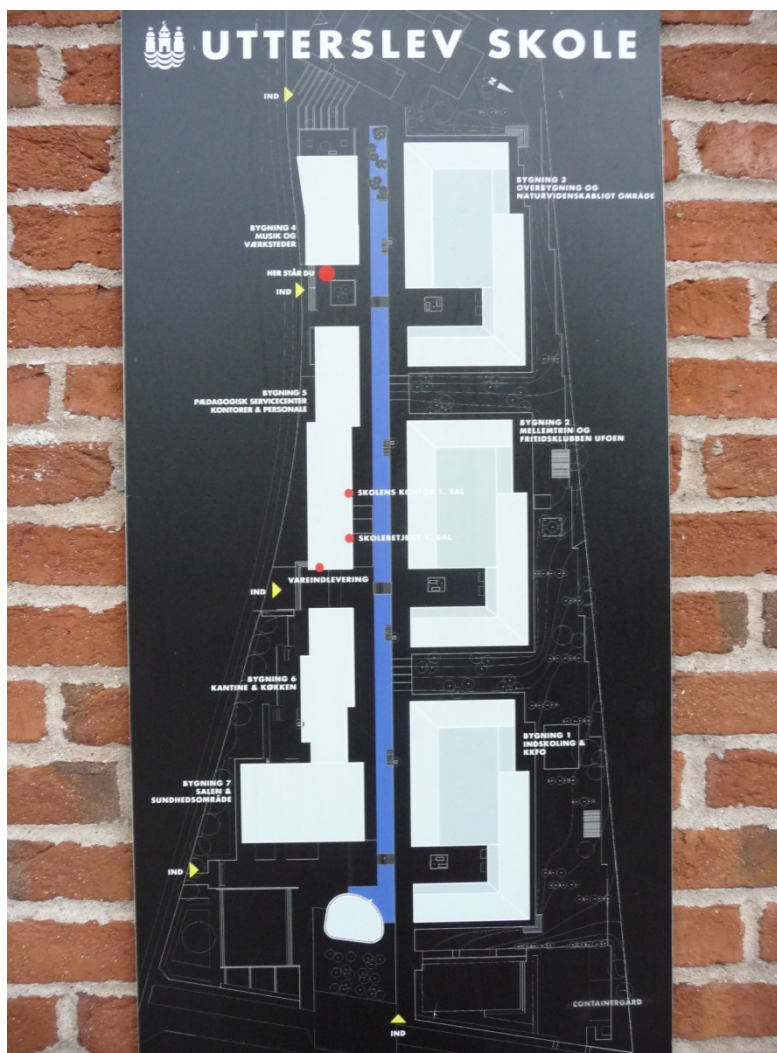
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Evaluation of Utterslev School



Research report

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Centre for Facilities Management – Realdania Research

Technical University of Denmark

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Introduction

This report presents the results from an evaluation of Utterslev School seen from a user perspective. The evaluation is conducted after agreement with the head master, Copenhagen municipality and Centre for Facilities Management – Realdania Research (CFM), Technical University of Denmark. The evaluation takes part in an international research project on evaluation of buildings in use with special focus on the teaching environments. Copenhagen municipality suggested Utterslev School as an example of a newer school.

The purpose of the evaluation of teaching environments is first and foremost to gain better knowledge on how to create efficient environments that encourage teaching and learning. Furthermore it is a research purpose to develop better methods to conduct evaluations with focus on the end users and the building's effect in relation to its usage.

The evaluation comprises of two interview meetings with the school management, two electronic questionnaires for teachers and students, interviews with students and teachers as well as observations of the teaching and the school buildings. Students from the 4th to 9th grade have participated. The study started September 2009 and ended February 2010.

The evaluation enters into the cooperation of researchers under the international building research organisation CIB, who has appointed Working Commission W111: Usability in the Built Environment. The evaluation is also a part of a pilot project under OECDs Centre for Effective Learning Environments (CELE), which means that the data results are based on the methods described by CELE (EQES User Manual). Their questionnaires were in this case translated from English to Danish. It should be noted that the chapter on observation is taken out in a later version of the manual.

The study was conducted by professor Per Anker Jensen, centre leader of CFM, and research assistant Pimmie Oesten, CFM.

This report includes the total documentation of the evaluation. A preliminary report in Danish of 6 April 2010 has been sent to the head of the school and it was discussed at meeting with the school management and the researchers from DTU. Based on that, some minor corrections have been made in the final report which has been published in a Danish version besides this English version.

The report opens with a summary of the results as well as discussion, assessments, conclusion and recommendations. Thereafter the procedure of the study is described and the school is shortly presented. The rest of the report consists of documentation and data analysis.

Summary

Utterslev School was built over 3 stages with occupancy from 2002-06 as a two lane school (two classes per year). First in 2009/10 the school has a full class year from kinder garden class to 9th grade. The school is an integrated institution with kinder garden and after school care, but this evaluation has only included students from 10 years old, i.e. 4th-9th grade.

The school was the first new school built by the Copenhagen municipality in 25 years. The municipality emphasized on creating a school with focus on its users in a broad aspect: children, parents, teacher and other school staff as well as the surrounding community. The users were involved in the planning, where the municipality invited school students from Copenhagen to give their suggestion for a modern and comfortable school. The outcome was exhibited at the town hall to inspire the architects competing in the contest on school design.

The physical structure of the school is characterized by the division of the school buildings into three basis building 1-3 for respectively the smallest classes (0th-3rd grade, 6-10 years), the middle classes (4th-6th grade, 10-12 years) and the oldest classes (7th-9th grade, 12-14 years). In addition there are buildings for the creative subjects, sports, pedagogic centre (also library), administration etc. The school is designed so it is prepared for an extension to have three lanes (3 classes per year), which is now decided to do. The evaluation has focused on the basis school buildings 2 and 3 as well as to some extent the other buildings.

The school is based modern pedagogic principals where the teaching is primarily project oriented with teacher teams for every class year, who plan the teaching together and implement it across the classes. In correlation to this method the school buildings are designed without the traditional closed off classrooms and have many openings between the common area and classrooms and classrooms themselves. The common area is very much emphasized in all three school buildings, which are similar in their structure with L-formed side building creating an inner courtyard. The large common room in the middle has a high ceiling and an open loft as a first floor.

The school has a green scientific profile which is seen in the outdoor areas that are designed to be implemented in the teaching. However, during the evaluation period this was not noticeable because of the season. The municipality wanted the school to be open to the local community so it was designed that a public pathway goes through the school area. It was also important that Utterslev School should be sustainable, which is reflected by the choice of having natural ventilation.

Main results

The student perception of the school

Accessibility: The student responses on the questionnaire show that there are very good results (80-100% agree or strongly agree) regarding accessibility on school, i.e. getting to the main entrance from the street, getting from the school to the outdoor areas and moving around the school's buildings. There are good results (60-80% agree or strongly agree) on getting from one floor to another in the buildings. There are medium results (40-60% agree or strongly agree) regarding the signs for main entrance and places to pick up or drop off students. However, there are bad results (20-40% agree or strongly agree) regarding both the inside and outside sign post for visitors or newcomers.

Teaching spaces: There are good results for sufficient space at the desks and to move around and work with others during the lesson, while there are medium results regarding internet access in the classrooms.

Comfort: Regarding the indoor environment there are good and very good results for lighting, medium results for temperature and air quality while there are bad and very bad results for noise. Regarding furniture there are medium results for sitting at the tables, but bad results for the comfort of the chairs.

The school's image: There are good results regarding both the internal and external visual appearance.

Security: There are very good results regarding security and safekeeping as well as almost all (94%) said that they could find the emergency exits. But only under 2/3 of the students (59%) knew how to start the fire alarm.

Maintenance: There are medium results regarding the cleaning of classrooms and cleanliness of toilets, while there are good or very good results regarding other maintenance.

Environmental sustainability: Regarding the eco-friendly options on the school the majority of the students (74%) find that there is space for separating waste in the classrooms, about half (52%) believe that there are energy saving devices, about 1/3 believe that there are spaces for separating waste outside the classrooms and water saving devices, while only few (13%) find that there are energy monitors etc. used by students. Regarding the efforts for creating a greener development there are good results for the students' perception of the teachers' interest in making the school greener, while there are only medium results concerning the students' own interest in making the school and the homes greener as well as the students' perception of the community's interest in making the school greener.

Interviews

Interviews with the students confirm that noise is considered as a serious problem, but there is generally a great sense of security and a good internal maintenance on the school since they experienced that things are repaired quickly. However, it was expressed that there are some differences among the school buildings where building 1 is more run down than building 3. The division of students after grades contributes to the sense of security by limiting any bullying of the youngest students. The oldest students experience that crosswise activities on school are mostly for the younger students and there is more focus on the natural science for the younger students as well.

Focus group

During the focus group with pupils from 8th class the following proposals were made for improvements of the school physical frames in case necessary investments were available:

- More class rooms and a dedicated room for each class
- Screen enclosures between class rooms and shared spaces
- Reduction of the large temperature variations in the buildings

The teachers' perception of the school

Teaching spaces: There are mainly good and medium results for the teachers' assessment of the teaching spaces. However, there are very good result concerning the possibilities to use electronic equipment in the teaching, while there are bad results regarding the teachers' own space during teaching.

Spaces for teaching staff: There are prevailing good results for spaces available for the teaching staff, but just medium results concerning work spaces for teachers outside the teaching period.

Comfort: Regarding lighting in the classrooms there are very good results for the light quality itself, but only medium results for the lighting control. Regarding the air quality and temperature there are medium results for air circulation and the temperature during winter, while there are very bad result for the temperature during summer and the control options. Then there are bad and medium results concerning noise.

School's image: There are very good results concerning the school's external visual appearance and good results regarding the internal appearance and if the school buildings express the importance of learning to the community.

Security: There are very good results regarding the security and safe keeping.

Maintenance: There are very good results regarding maintenance.

Interviews

Like the interviews with the students, the interviews with the teachers confirm that noise is regarded as a serious problem. Some spaces have been closed partly off with glass walls between the classrooms and hall way, but the classrooms are still open to each other. There are some specific spaces that are problematic. Meanwhile it depends also on the students' behavior as one of the interviewed teacher found that the 9th graders function well with the open spaces while others do not for example some boys in the 8th grade.

The same teacher pointed out that they have not yet fully developed the usage of the rooms in building 3, where capacity is now on its highest with the first classes of 9th grade for this year. The usage of building 2 is on the other hand more developed. So this means that the division of teaching spaces is laid out by the teachers ad hoc, where the teachers needing to use the interactive boards have first priority.

Discussion and assessments

The usage of areas in the school buildings (building 1-3)

The common room:

The school buildings are centered on a large common room with a high ceiling and a lot of daylight. High large windows are placed on the common room's three sides while south side is open to a loft on the first floor. Down at the floor level there are windows on the north side, glass walls towards the classrooms on the west, walls with lockers on the south and a small kitchen on the west.

The floor is made of dark concrete and is generally clean since both students and teachers use indoor shoes even though it was snowing. Visitors had to use plastic slipcovers. The most of the common room is open without furniture, but there were tables, chairs and benches in the north end and along the walls.

We experienced how they used the common room for morning gatherings in building 2 and 3. In building 2 the students sat on the floor, while they sat chairs and benches in building 3. It was our impression that the common rooms function well for this event. They are also used for group work, breaks and lunch area. Furthermore the common room is a central gathering room from where the students are sent off to various rooms and buildings. This causes higher noise levels for the surrounding areas.

The loft:

At first floor level in every school building there is a loft area of approximately 150m², which is basically open to all sides except in building 3. In building 3, the south side is closed off with a wall. Here there are a computer area and an area with low couches, while in building 2 there are also table tennis and table football. We observed the loft in use during a class meeting for the boys in the 8th grade and the experience was that there was a lot of disturbing noise from the common room and hallway as well as extra noise coming from other students when they had to use the computer area.

Recently there have been problems with students throwing things from the loft, so the students are prohibited to use the loft without a teacher present. The lofts are therefore difficult to use as a teaching space, but can primarily be used as an activity area during breaks.

Teaching spaces:

One of the characteristics of Utterslev School is that there is a variety of different teaching spaces. This is especially seen in building 3, where there have been significant modifications because many of the classrooms have been used for another purpose before the oldest classes moved in. On the other hand it is also characteristic that the majority of classrooms are open to the hallway and between classrooms. The openness between the classrooms is probably designed so to support the transversal school work between the two classes per year.

A teacher assessed that some of the best functioning teaching spaces in building 3 are two neighboring classrooms, which are closed off to the hallway, open to each other and have a small room in the corner. Meanwhile the impression was that interior arrangement of these rooms is a bit coincidental and impersonally, but highly flexible. To support the rooms' flexibility they used stools even though it may lower the sitting comfort for the students.

Area disposition:

The teachers are jointly responsible for the disposition of the teaching spaces in each of the three school buildings, which is very much ad hoc. Also we experienced that the school buildings were completely filled with students causing a lot of disturbing noise, while at other times the buildings were almost empty because the students had subjects elsewhere. With regard to the usage of the buildings it could be more appropriate to spread out the students for a better space disposition and to avoid the high noise levels.

Comfort and indoor environment

Noise:

The majority of the noise comes from the students' activities in the classrooms and especially in the common areas. The classrooms are hard to screen against noise since they are either partially or completely open. According to one teacher some classes better can handle these open environments than others.

The building acoustics are also bad with a high level of sound transmission mainly through the floor construction. Students moving chairs and tables can easily be heard from one room to another. The cause is probably that the floor is constructed as a solid concrete slab, which intention was to give the school a robust and durable material. However, the school has been forced to lay a linoleum floor covering some places to diminish the noise levels. This has some effect on the reverberation time, but is not sufficient to reduce the sound transmission. In addition the building materials chosen for the school buildings are primarily glass and concrete, which are very sound reflecting.

Temperature:

A living pergola with twines was designed as permanent solar screening in front of the classroom facades so to give shade during summer and none during winter. The idea is great in theory, but in reality it functions quite poorly at present time since the twines are not fully grown to cover the entire pergola even after 4 years. This often causes the southern classrooms to overheat during the summer period. The school has therefore put up light curtains indoors to minimize the solar radiation which does not reduce the heat load. Simultaneous there is not an air change high enough to cool the rooms.

Natural ventilation:

During the inspection of the school and its buildings it was seen that the school has natural ventilation system of the type "cross ventilation with stack effect". This means that the outdoor air is let in by a mechanical opening of windows and crosses through the classroom out to the common room. The heated air will seek upwards in the common room where it is vented out by opening of the higher windows. The ventilation system is mechanical operated by CO₂ sensors located in the different rooms.

The problem with natural ventilation is that it is difficult to calculate exactly how the air flows will move through the building and therefore the air change is only an estimate. It also depends on a sufficient stack effect and the wind impacts on the buildings, where a strong wind can cause either pressure or suction on the building surfaces. There is of course a large energy savings potential by using natural ventilation and especially combined with a heat recovery unit.

The ventilation system has a negative effect on the indoor environment since there is a downdraft from the opening of windows during the winter. Furthermore both the students and teachers do not understand the

meaning behind the system as there is not necessarily a connection between the temperature and the opening of windows. So nobody has explained them that the ventilation system operates after CO₂ concentrations. Then the thought behind using the school's eco-friendly buildings as the frame for green thinking is lost in the process.

Conclusion and recommendations

The relationship between organizations and buildings can be seen as a partnership of mutual dependence. Buildings are never neutral – they can either promote or inhibit organizations in developing itself and meeting their objectives. Similarly, organizations can use or misuse buildings. The more an organization is aware of the possibilities to exploit the potential of a building, the better the building can support the organization.

Utterslev School is generally a successful school with a good image, great comfort and good maintenance. The school is designed for project-orientated teaching with an emphasis on sustainability with natural ventilation. These positive intentions have also led to some less fortunate circumstances relating to the indoor environment. The large open teaching spaces contribute to the noise problems and control of temperature and ventilation is not adequate for users. The pupils proposal for improvements includes more class rooms and a dedicated room for each class, screens enclosures between class rooms and shared spaces, and reduction of the large temperature variations in the buildings.

However, there are opportunities for the users to obtain even greater benefit and enjoyment of the school without having to involve major alterations or other costly measures.

Based on the evaluation the following recommendations to the users are given:

1. **Information on the buildings' functions:** Knowledge of how the building's technical systems are functioning is poorly among teachers and pupils. This applies not only the natural ventilation, but also other sustainability initiatives, such as water savings are not known by many. Even a basic fact such as the use of fire alarms is known by under 2/3 of the students. It is therefore recommended that school management will ensure that publicize the buildings' functioning by providing oral and written information to both teachers and students.
2. **Develop the use of the buildings:** It takes time to learn how to use buildings in a way that fits an organization's needs. The more you work consciously with this, the more buildings give back to promote the organization's needs. It is recommended that the teacher teams at the school evaluate in unison the way the rooms are currently used for each of the school buildings and draw up plans for how they want to develop their use. Herewith they should also schedule more cohesively the area disposition.
3. **Using buildings actively in the teaching:** The buildings are part of students' daily life, which more or less taken for granted. But buildings are also a combination of a great physical design and high technical machinery essential for both energy on both local and community level. Since the students are placed in the middle of the school, it would be natural to treat the buildings as a topic in the teaching - in particular as a technical nature and green profile school. This applies both to how the building technically works, what they consume of energy, emit of CO2 emission and produce of waste as well as how to use it and how it can be used. It is recommended that each teacher team takes up how the buildings could be involved in the teaching for example during morning gatherings, in class hours and in science education.

The completion of the study

Implementation of the evaluation of Utterslev School was agreed at the meeting on 18th of June 2009 at the school attended by the head master Geert Hansen, former property manager Flemming Wulff Hansen, Copenhagen Properties and professor Per Anker Jensen, CFM. As a basis for the meeting had Per Anker Jensen prepared a plan of study.

The study itself has included the following elements:

- Two interview sessions with school management
- Two surveys with questionnaires for respectively students and teachers
- Focus groups, interviews and observations over two days

Interview meetings with school management: The first meeting took place on 30 September 2009 with the participation of school leader Geert Hansen, Deputy Aase Hammer and teaching leader Pia Mølholm, Utterslev School and Per Anker Jensen and Pimmie Oesten, DTU. The meeting concerned the school's objectives and priorities based on CELE's questionnaire on *Quality Performance Objectives* (QPO) and the result is documented in response to the questionnaire's questions, see section on QPO. Also an inspection tour of the school was completed at this time. The second meeting took place on 28 October 2009 with the participation of head master Geert Hansen, technical property manager Ole Olsen, Per Anker Jensen and Pimmie Oesten. The meeting concerned the background information on school based in CELE's questionnaire *School Background Questionnaire*. Following the meeting were data on energy consumption in agreement forwarded by Ole Olsen. The outcome of the meeting is documented in response to the questionnaire's questions, see section thereof.

Questionnaire surveys:

Questionnaires for students and teachers from CELE's User Manual was translated from English into Danish and sent to the headmistress of the possibly annotation, but there were no comments from the school. The questionnaires were made available electronically on a web page in December 2009 and it was initially agreed with the head master to run over a one week period in week 50, i.e. 7th -11th of December 2009. There were, however, very few responses during this week so the survey was extended until mid February 2010.

The result was 88 responses from students and 9 responses from teachers. Apart from that there are around 300 students and approx. 40 teachers who could have answered, which correspond to response rates of 29% and 23%. CELE recommended responses from approx. 25%, so the resulting response rates in the study can be considered satisfactory. Among students, there was a fairly even distribution by sex and age with 54% boys and 46% girls mainly from 10-16 years - but with 1 student of 9 years and 1 student of 17 years - and with most of 13 years.

The questionnaires were analysed and is shown statistically in the report as graph and graded in a 5 group scale groups (increments of 20% for the sum of responses of agree and strongly agree) as used in a parallel Norwegian evaluation in accordance with section questionnaire results, see section with the survey results.

Focus groups, interviews and observations:

The researchers visited the school in the first week in February 2010 over a two day period. Wednesday the 3rd of February started with observation of the daily morning gathering in building 2 and continued with the

observation of creative subjects for the 6th graders starting with the common introduction and division of students for each subject. One researcher followed the needle work lesson for one of the student groups, while the other interviewed a teacher from building 2.

Friday the 5th of February also started with observation of the morning gathering this time in building 3 and continued with an interview of a teacher from building 3 and a focus group session with eight students from 8th grade. Then there was the observation of a class meeting in the 8th grade starting with common introduction and continuing with the parallel observations of class sessions divided into boys and girls.

The results of these interviews and observations are described in the report's final section.

Experience with the use of CELE's methodology

Interview meetings with school management: Interview meetings with school management: Results of CELE's questionnaire on *Quality Performance Objectives* have been difficult to use in this evaluation, but it is possible that it has its merits in comparison to evaluations in different countries. The same applies to a part of the results from CELE's questionnaire on *School Background Questionnaire*, but it is clear that some background information is essential to have knowledge on.

Questionnaire surveys: These surveys can be said to constitute the essential part of the evaluation, and they have together provided a good quantitative picture of how users are experiencing the school. From one of the interviewed teachers, we have been informed that students from the 4th grade, which are the youngest of the respondents, had difficulty answering some of the questions. This applied in particular Question 1.1 on availability (signposting, etc.), 3.1 on comfort and 7th 2 on efforts related to environmental sustainability. This is also confirmed by a large number of responses with "Don't know", especially for the questions of environmental sustainability.

Focus groups, interviews and observations: It was difficult to get organized formal focus group sessions, so we have only implemented one of these with a group of students from 8th grade, but supplemented with interviews of more or less formal nature with 2 students from 6th grade and two teachers from respectively building 2 and 3. Together with the observations the interviews gave a good qualitative impression of how Utterslev School is experienced and used by students and teachers.

Overall, the qualitative data collected from interviews and observations is of vital importance to understand and explain the results of the quantitative data collected from the questionnaire surveys. It could have been desirable to have a more profound dialogue with the users through several focus group sessions combined with prior joint inspections (walk-throughs).

The chosen school - Utterslev Skole

Utterslev School is the first public school built by Copenhagen municipality in 25 years. The school was built in three stages, where the first stage was finished in august 2002 and the last in 2006. The school has a student capacity of approximately 580 divided between 10 class years (0th – 9th grade). It also contains an after-school centre for 190 children and a club for 130 children.

Owner	Copenhagen municipality
Architect	KHR Arkitekter
Landscape architect	Peter Holst MDL
Consultative engineer	COWI
General contractor	Einar Kornerup
Built	2002-2006
Price	125.6 M kr.
Areal	9000m ²



The school is designed after a presentation of suggestions formulated by the Administration of Education and the Youth in collaboration with a focus group of politicians, school administrators and students. The request was a school with a scientific profile that would motivate students to explore and experiment.

The school buildings are structured around a so called blue line, an outdoor channel environment, that functions as walking and play area. On the one side of the channel, the three basic school buildings are situated and students are divided in after age range. These basic buildings are all built up around a large open space that functions as a common room for the students. The school's other buildings accommodate the administration, the pedagogic centre, sports hall, workshops, music rooms and a canteen area.

Sources:

Utterslev Skole. Booklet by Copenhagen Municipality, Administration of Education and the Youth, October 2002

www.utterslevskole.dk



School building 1 viewed from channel area



School building 3 viewed from channel area



View of the administration building from the street



Office space for teachers or administration



Teachers' large staff room in building 5



The pedagogic centre / school library



Common room/area in building 2



The kitchen area in the common room, building 2



Two examples of the interior in the classrooms in building 2

QPO Priority-rating questionnaire

OECD has in their international study set up 21 questions concerning quality performance objectives with the purpose to better understand the broader issues and constraints that can have some impact on quality in educational spaces. The questions are set as broad benchmarks to evaluate a school's performance.

Each question is to be answer after the school's prioritisations on:

1. The educational mission
2. The everyday functioning
3. The local, regional and national policies and regulations

The questionnaire was answered by the headmaster, Geert Hansen, and teachers Aase Hammer and Pia Mølholm.

QPO	1. How important is each QPO in the educational mission of the school or (if it exists) the design brief? <i>1.1. Very important</i> <i>1.2. Important.</i> <i>1.3. Possibly important although not specifically mentioned.</i> <i>1.4. Not important and not specifically mentioned.</i>		2. How important is each QPO in the everyday functioning of your school? <i>2.1. Very important.</i> <i>2.2. Important.</i> <i>2.3. Possibly important although not or rarely specifically addressed.</i> <i>2.4. Not important and not specifically addressed.</i>		3. How have local, regional and national policies and regulations shaped each QPO? <i>3.1. Significantly: It is a policy priority and local, regional and national guidelines or regulations exist.</i> <i>3.2. Moderately: It is a policy priority but guidelines or regulations have not been developed or have been developed but implementation or enforcement is difficult.</i> <i>3.3. Not at all: it is not a policy priority and local, regional and national guidelines or regulations do not exist.</i>	
	Rating	Additional comments	Rating	Explain briefly if rating for Question 1 is different to Question 2	Rating	Describe briefly the local, regional and national guidelines or regulations
QPO 1. <i>Urban context.</i>	1	School very much used by the local community, represents the local area	1	Large amount of applications.	1	Requirements by law
QPO 2. <i>Openness to the community.</i>	1	There is direct passage to the outside facilities and the sports hall.	1	School building and sports hall is used by other organizations.	2	Managed centrally by the municipality, applications for fixed periods for using the sports hall
QPO 3. <i>Accessibility for students with special needs.</i>	1	Important for everybody to be able to attend this school	1	Elevators, ramps and primary one-storey buildings	1	Requirements by law

QPO 4. External accessibility.	1		1	A part of a public path system, enclosed roads	1	<i>Department of Real estates, road and park contributed to the school area layout</i>
QPO 5. Internal accessibility.	1	Easy to survey, sections divided into buildings	1	Teachers are each affiliated to a sector, but otherwise know the school well	3	No requirements
QPO 6. Student capacity.	1	School with dual track, i.e. two classes per year group Somewhat oversized.	1	Big common room with enough space for students	2	Law requires classrooms, but otherwise no requirements
QPO 7. Additional student capacity.	4	The school is designed with dual track, poor possibilities for retrofitting	4	The school is missing a gathering place for all the school's students and parents	3	
QPO 8. Space for teaching staff.	1	There have been a great deal of focus on this topic	2	Too few meeting rooms since some meeting rooms had to be used to administration	3	Requirement: there must be room for the union representative
QPO 9. Size of learning and support spaces.	1		1		3	No specific requirements on common room nor classrooms
QPO 10. Furniture.	1	The furniture is adapted to the teaching method	1		3	The teaching environment law does not mention ergonomics
QPO 11. ICT.	1		1	Students have access to computers and wireless internet. Interactive boards (smart board) in most classrooms	2	The Ministry of Education demands a certain number of computers per school, but there is no inspection on schools
QPO 12. Internal and external noise.	1		2	High noise levels when there are students in the common room/walking area An expert is currently reviewing the situation	2	
QPO 13. Lighting.	1		1	A lot of daylight coming from the large window sections	2	Legal demands on the level of lighting (lux) as well as references to Danish standards
QPO 14. Maintenance.	1	High prioritizing on the school looking "nice and neat". Are currently seeking more funds for maintenance	1	The school is responsible for the internally maintenance	2	"Københavns Ejendomme" (municipal administration of real estates in Copenhagen) is responsible for the externally maintenance, but only if requested by the school
QPO 15. Temperature and humidity.	1	High focus on indoor environment	2	High heat levels caused specially the large amount of solar radiation on the south side	2	Work environment requirements and building regulations

QPO 16. Symbolism.	1	Exciting teaching environment, a deviation from the traditional public school	1	The school gets profiled, symbolizes the modern teaching method	3	
QPO 17. Aesthetics.	1	Careful at maintaining the basic idea in the architecture	1		2	A part of the district plan, "Københavns ejendomme"
QPO 18. Learning resource.	1	The channel is a intentional teaching area	1	Direct access to outdoor areas, opportunities for morning gathering for students in each department	3	
QPO 19. Healthy environment.	1	Great opportunities for opening room to the outdoor areas Smoke free area	1	Possibilities for great physical motion and outside teaching Healthy lunch program	2	Lunch program from the municipality, who is currently working on a health policy for schools
QPO 20. Safe environment.	1	Important to give students a safe environment	2	There have been some unwanted persons on school grounds, can cause insecurities. Vandalism in the local area	2	
QPO 21. Environmental sustainability.	1	Tries to secure the sustainable element Working on receiving the "green flag"	2	Problems with daylight control and thereby energy consumption	2	There have been tightening on environment regulations for the school
Other. Working environment for teachers and administration	1	A more open office environment	2	Office area does not follow the schools structure and openness.	2	The fire department set demands on the office area's layout during the building phase

Notes:

- Missing depot space under the buildings, which was not considered in the building process
- The after-school facility is situated in connection with the school, which can therefore cause some space problems with common areas and give more administrative work

School background questionnaire

1. School location

1.1 Which of the following best describes the community in which your school is located?

A large city with over 1 million people

1.2. Please describe in the box below, in 150-200 words, the urban setting of the school

Suburban neighborhood with mixed types of housing (only residences and institutions)
 Middle to high social class, fully developed residential area
 Public transport is not optimally accessible
 Well provided regarding police and fire station in the near area
 Vandalism/ turmoil in periods since the school is situated near Cph Nordvest (neighborhood dominated by turmoil)

2. School demographics

2.1. As at March 31, 2008, what was the total school enrolment (number of students)?

a) Number of boys: approx 100 (March 31, 2008 – approx. 150 in December 2009 at time of survey)

b) Number of girls: approx 100 (March 31, 2008 – approx. 150 in December 2009 at time of survey)

These numbers of March 31, 2008 are based on the focus area of 4th to 7th grade, otherwise in total 435 students from 0th to 9th grade DK at that time.

The first 8th grade started in summer 2008 and the first 9th grade started in summer of 2009. From that point in time the full capacity of the school was utilised.

2.2. Which grade levels and corresponding age ranges are found in your school?

- | | | |
|---|---|-------------------------|
| a) Grade 5 (4th grade DK): | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Age range: 10-11 years. |
| b) Grade 6 (5th grade DK): | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Age range: 11-12 years. |
| c) Grade 7 (6th grade DK): | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Age range: 12-13 years. |
| d) Grade 8 (7th grade DK): | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Age range: 13-14 years. |
| e) Grade 9 (8 th grade DK): | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Age range: 14-15 years. |
| f) Grade 10 (9 th grade DK): | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Age range: 15-16 years. |

2.3. Is student accommodation provided at the site?

Yes ☐ No ☒

2.4. What is the legal student capacity of the school?

Approx 504 students

2.5. How many teaching staffs are there at your school?

Full-time teaching staff: 40 (approx 4 teachers per class year from 4th to 9th grade)

Part-time teaching staff: 1

2.6. How many non-teaching staffs are there at your school?

Full-time non-teaching staff: 15 (ca. 35 pedagogues)

Part-time non-teaching staff: 0

2.7. How many students with special needs are enrolled at the school?

5-6 students

3. Ownership, financing and management of the school estate

3.1. Is your school a public or a private school?

A public school

3.2. About what percentage of your total funding for a typical school year comes from the following sources?

a) 100 %: Government (includes departments, local, regional, state and national)

b) 0 %: Student fees or school charges paid by parents

c) 0%: Benefactors, donations, bequests, sponsorships, parent fund raising

d) 0%: Other

Total 100%

3.3. Which body is primarily responsible for allocating resources related to operational issues, such as maintenance of school buildings, minor repairs and rental of school spaces?

Local authorities or governments

3.4. Which body is primarily responsible for the management of these resources related to operational issues, such as maintenance of school buildings, minor repairs and rental of school spaces?

School, school board or committee

3.5. Approximately what percentage of the school budget is spent on maintenance of school buildings, minor repairs and rental of school spaces?

2.5% (internal maintenance)

3.6. Who at the school is responsible for managing the school building?

The technical caretaker

3.7. Were public-private partnerships used in the construction, maintenance or everyday operation of the school?

Yes ☐ No ☒

4. Community use of school

4.1. How frequently is the school used by the community?

Every day

4.2. For what purpose is the school used by the community?

Adult education courses

Recreational activities

Community meetings

Sport clubs, jazz café, "spare time education" for children and the young

4.3. Is the community involved in assisting with school maintenance or providing the school with additional materials or equipment?

Yes ☐ No ☒

5. Activities at the school

5.1. Please indicate the full name of the programmes offered at your school

Public school in Denmark corresponds to secondary school, first and second stage

5.2. For each programme in your school:

a) How many weeks are in the school year?

40 weeks

b) How many days or evenings per week is the school used?

5 days

c) How many hours in total are there in the school week? (include lunch breaks, study hall time, and after school activities)

26-28 hours

d) How many shifts are used (i.e. one shift, all day long, morning, afternoon, evening, night)?

1 shift

6. School site

6.1. Is the school site located:

In a floodable zone?

Yes ☐ No ☒

In a seismically active area?

Yes ☐ No ☒

Near a pollutant source that may impact on the school site (e.g. chemicals factory, underground gasoline storage tank, major motor vehicle highway)?

Yes ☐ No ☒

Near any other high-risk area?

Yes ☐ No ☒

6.2. What is the total site area?

20000m²

6.3. What is the gross floor area?

8000 m² excl. 1000 m² basement

Total built surface area: 5913m²

7. Construction and maintenance of the site

7.1. In what year was the main school building originally constructed?

2002

7.2. In what year(s) were major building renovations undertaken; and what was the nature of this work?

No renovations, school built over 3 stages from 2002-2006

Year	Type of new buildings or additions
2002	5 buildings: administration, sports hall and 1 school building
2004	2 buildings: hereof 1 school building
2006	1 school building

7.3. What major repairs and maintenance have been undertaken at the school in the last five years?

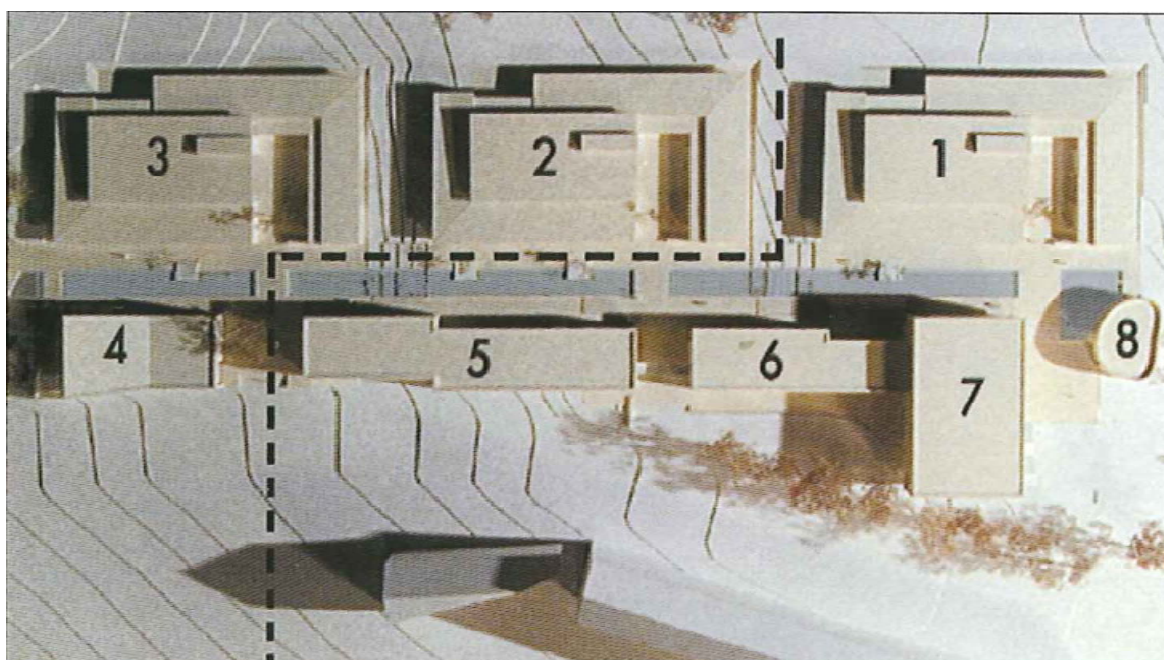
None

8. Spaces and places in the school

Type of space	Number of spaces	Subject(s) taught in teaching space	Approximate area (m ²)
Teaching spaces: classrooms	36	Danish, Mathematics, English, German, French, social studies, history	$36 \times 60 \text{m}^2 = 2160$
Teaching spaces: science laboratory	8	Physics, chemistry, geography,	$8 \times 75 \text{m}^2 = 600$
Teaching spaces: special education room		Art, woodwork, needlework,	
Teaching spaces: library and resource/media centre	1		800
Teaching spaces: gymnasium	1	Physical education	$26 \times 15 \text{m} = 390 \text{m}^2$
Teaching spaces: Multi-purpose rooms	1		100
Teaching spaces: Other (please specify)			
Athletic spaces, indoor and outdoor			
Management spaces, including areas for administration and teaching staff.	1		$600 + 200 = 800 \text{m}^2$
School support facilities, including kitchen, dormitories and infirmary	1		500

Social spaces, including play-grounds, student room and auditorium.	3		3x1000m ²
Circulation spaces, including corridors and lobby.			
Other (please specify) Loft	3		3x150 = 450m ²

8.2. Architectural drawings of the school and grounds



Building 1: School building for minor students aged 6-10 years, 0th to 3rd grade DK

Building 2: School building for students aged 10-12 years, 4th to 6th grade DK

Building 3: School building for students aged 11-14 years, 7th to 9th grade DK

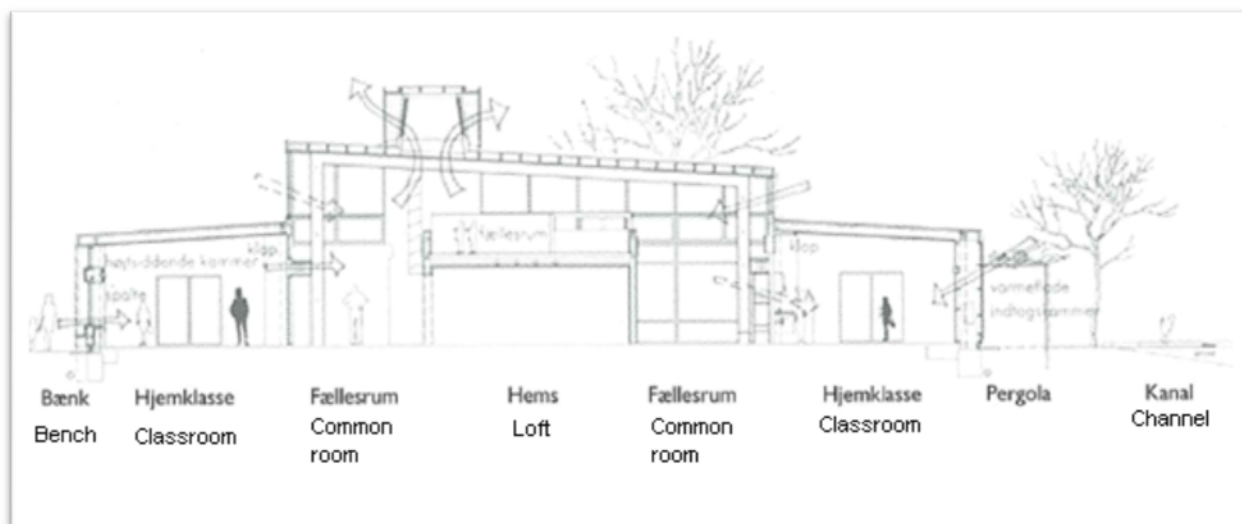
Building 4: Building for music and craft

Building 5: Administration and library/media centre

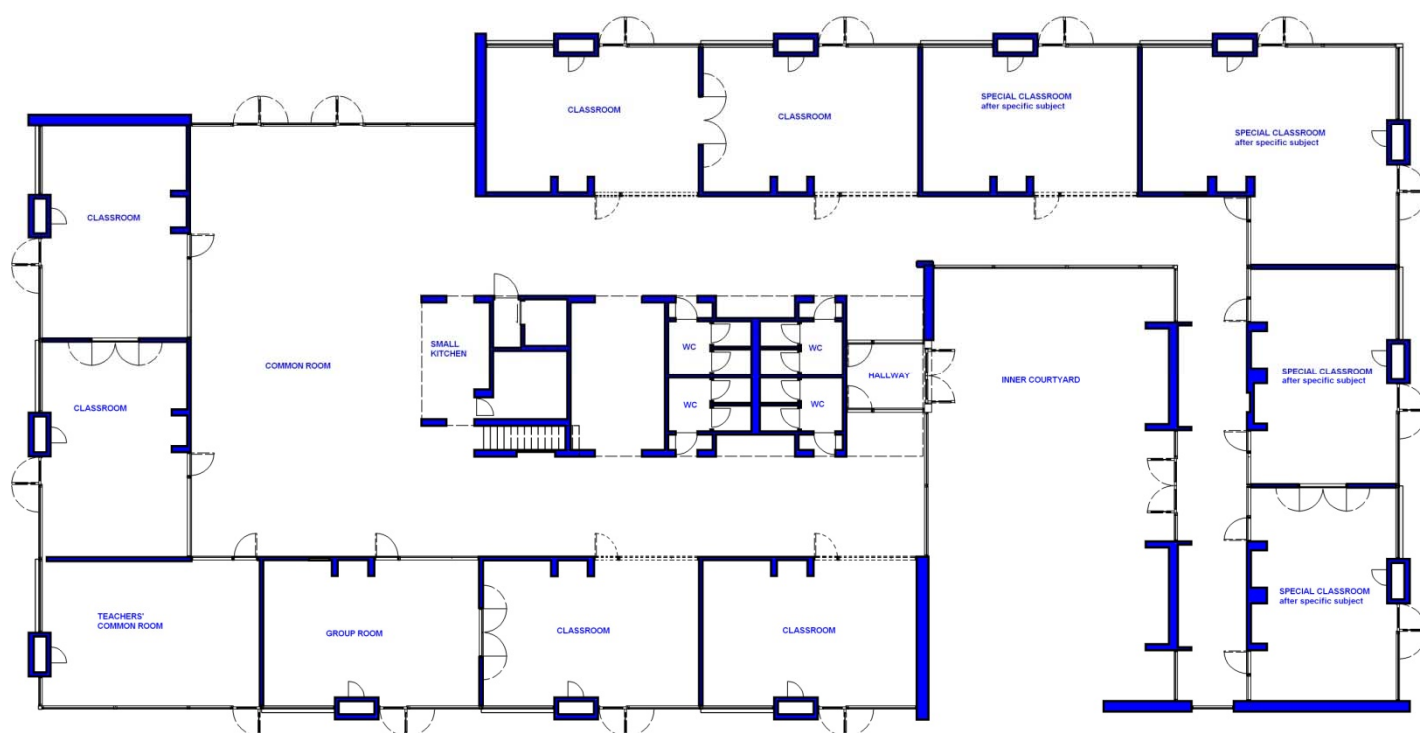
Building 6: Canteen and kitchen

Building 7: Sports hall

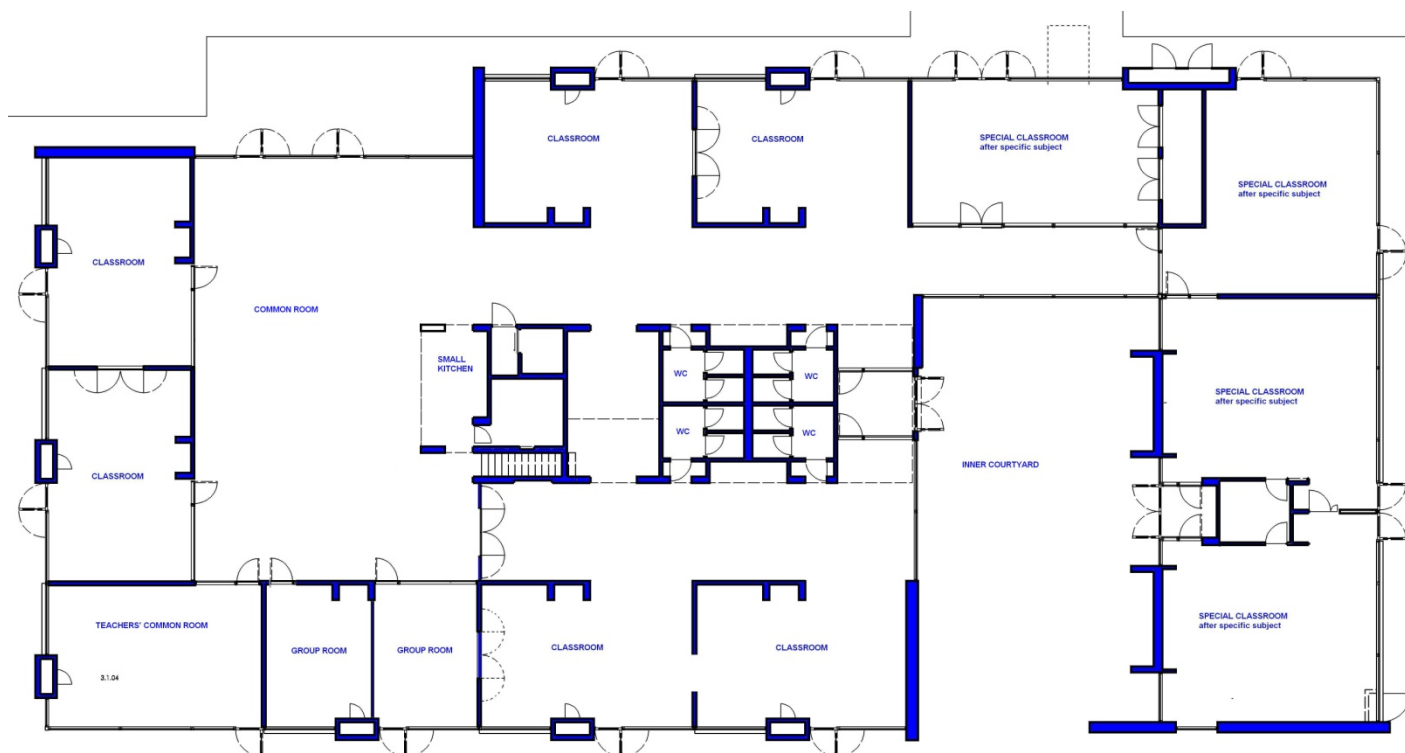
Building 8: Playground/small gym



Sectional drawing of school building



Plan drawing of school building 1 & 2



Plan drawing of school building 3 (an extra wall between common room and hallway was put up during leasing to a special school 2006-2008)

9. Environmental sustainability

9.1. How much water is consumed in the school year? 3231,000 Litres (3231m³)

9.2a. How much electricity is consumed in the school year? 261,429 kWh

The school gets its heat from district heating with consumption per school year 788,972 kWh

9.3. Does your school produce its own energy (i.e. through photovoltaic panels, solar panels, wind turbines)?
Yes ☐ No ☒

9.4. Which water saving practices are used at your school (e.g. rainwater collection, dual-flush toilets, taps with timers, etc.)?
Yes ☒ No ☐

Time controls on tap water, 2 types of toilet flush, collection of rainwater in canal

9.5. Is recycling practiced at your school (i.e. separation of paper, glass, plastic, etc.)? Yes ☒ No ☐

General household, cardboard, paper, electronics, metal, glass, toxic waste

9.6. Are there any other waste reduction practices at the school?

Yes ☒ No ☐

Composting of packaging for school food

9.7. Are there examples of sustainable design and construction at the school (e.g. use of passive thermal design, renewable construction materials, natural ventilation)?

Yes ☒ No ☐

1. Natural ventilation
2. Heat recovery

9.8. How are the principles of environmental sustainability integrated into the curriculum?

Currently working on a green profile and environmental policy
The school administration wants to achieve environmental certification
Eco-friendly conduct is a part of a nature scientific profile school, are supposed to show good example – sustainable development

9.9. How is the school (grounds, building) used for demonstration or instruction?

Outdoor areas refer to the school's green profile with fauna and canal system – nature scientific profile
Greenhouse is planned, outdoors workshops – able to teach outside
The school offers lessons to students and teachers from other schools because of its profile status

10. School safety and security

10.1. Is there vandalism or property damage at the school?

Yes ☒ No ☐

There have been some episodes in the past, but no current vandalism

10.2. Is there a high incidence of theft at the school?

Yes ☐ No ☒

10.3. Is there a plan showing emergency exits in each classroom?

Yes ☐ No ☒

10.4. Are fire extinguishers located near each classroom?

Yes ☒ No ☐

10.5. Is there a functioning fire alarm in the school?

Yes ☒ No ☐

OECD questionnaire for students and teachers

The questionnaires were answered online in the period of December and start January 2010. The analysis is divided in students and teachers for whom there are different questionnaires.

Most questions were statements and had the following options: Strongly disagree, disagree, neutral, agree and strongly agree as well as "Don't know". Corresponding to the OECD's possible answers:

Strongly disagree 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

Strongly agree Not applicable ☐

In the analysis there is used the following grading:

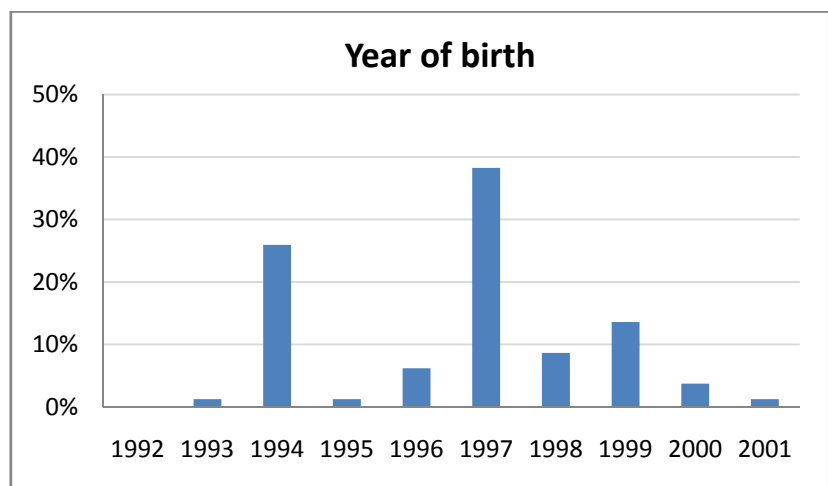
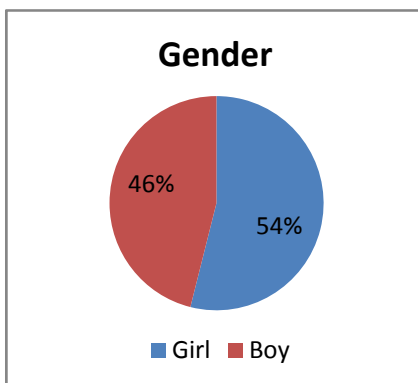
Very good:	80 – 100 % respondents agree or strongly agree (ticks in box 4 or 5)
Good:	60 – 80 % respondents agree or strongly agree (ticks in box 4 or 5)
Medium:	40 – 60 % respondents agree or strongly agree (ticks in box 4 or 5)
Bad:	20 – 40 % respondents agree or strongly agree (ticks in box 4 or 5)
Very bad:	< 20 % respondents agree or strongly agree (ticks in box 4 or 5)

Students' responses

A total of 88 students from 4th to 9th grade have answered the questionnaire completely.

Division of gender and age

The gender division is very equal with **54% girls and 46% boys**. The students from 4th and 9th grade are all born in the period from 1993 to 2001, e.g. the age range 9-17 years with a **majority of 13 year olds**.



Question 1.1: Accessibility

There are **good and very good results** regarding the **internal of the school**:

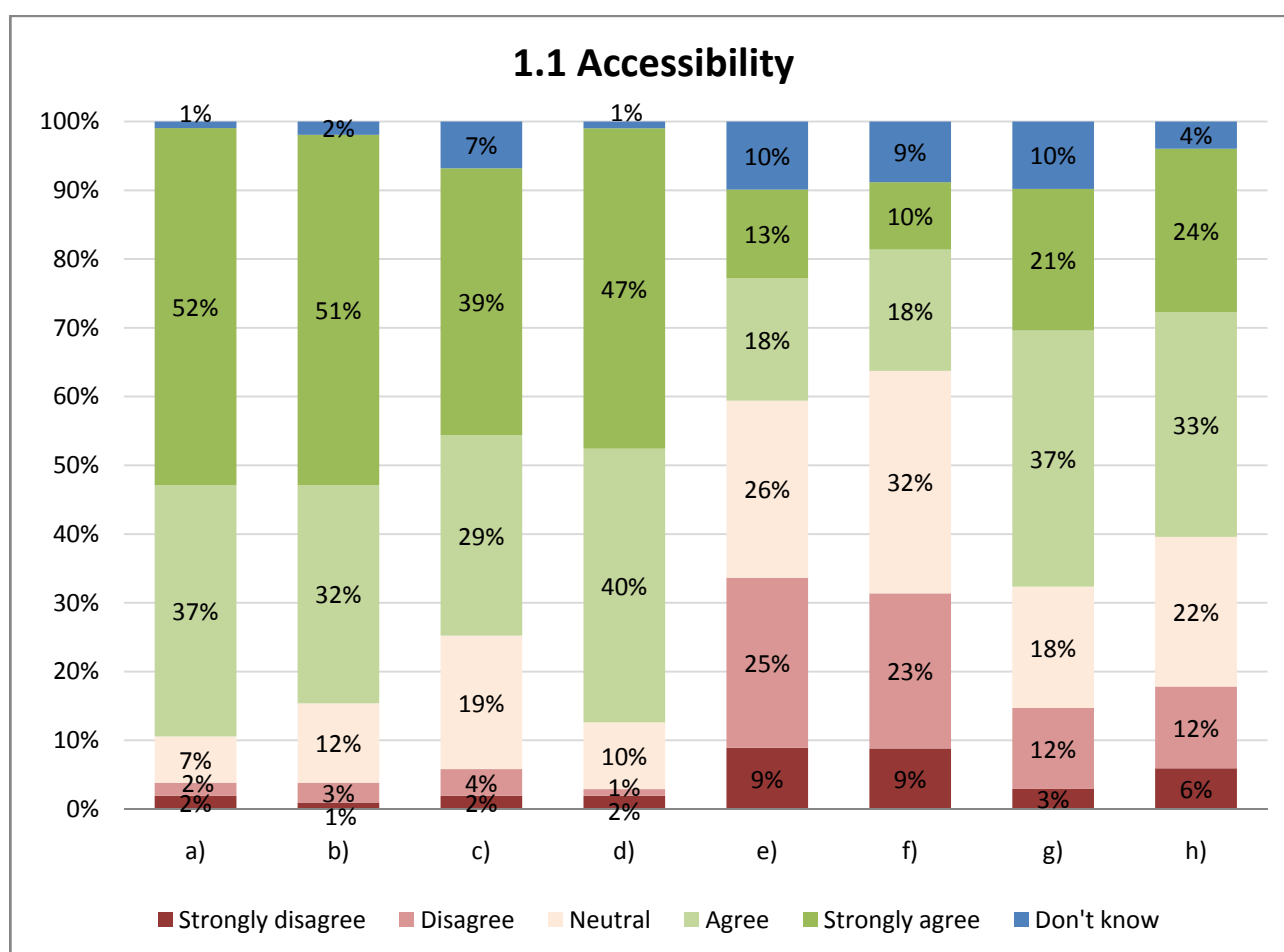
- a) It is easy to get to the main entrance from the street 88 %
- b) It is easy to get from the inside to the outside of the building 83 %
- c) It is easy to get from one floor within the building to another 68 %
- d) It is easy to move along the same floor 86 %

There are however **bad results** regarding the **accessibility for visitors**:

- e) The routes or pathways around the inside of the building are well signposted or easy to identify for visitors or newcomers 31 %
- f) The routes or pathways around the outside of the building are well signposted or easy to identify for visitors or newcomers 27 %

There are **medium results** regarding signposting of the main entrance and parking spaces:

- g) The main entrance is well signposted or easy to identify for visitors or newcomers 58 %
- h) There is sufficient room to drop off and pick up students and for others to drive through 56 %



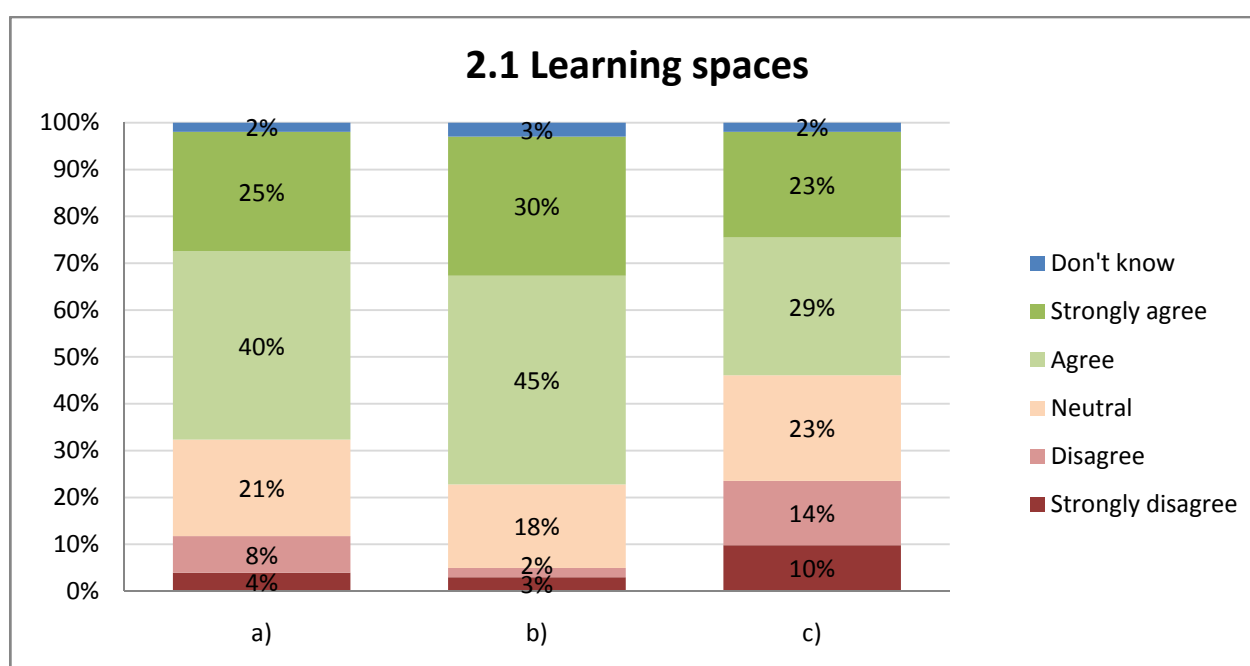
Question 2: Learning spaces

There some **good results** regarding **space**:

- a) There is plenty of space for me to work at my desk 66 %
- b) There is plenty of space for me to work around in the classrooms and work with others during class 74 %

There are **medium results** regarding **internet access**:

- c) I have access to functioning computers with internet access in my classroom 52 %



Question 3: Comfort

3.1 Indoor environment

There are only **medium results** concerning **temperature and air quality**:

- a) My classrooms have good air circulation 53 %
- b) The temperature in my classrooms is comfortable in the winter 56 %
- c) The temperature in my classrooms is comfortable in the summer 59 %

3.2 Noise

There are **very bad and bad results** concerning **noise**:

- a) There is not too much noise coming from inside the classrooms to disrupt my work 19 %
- b) There is not too much noise coming from the outside of the rooms to disrupt my work 24 %

3.3 Lighting

There are **good and very good results** concerning **lighting**:

- a) There is natural light from the windows 82 %
- b) My classrooms have good lighting so that I can work comfortably 78 %

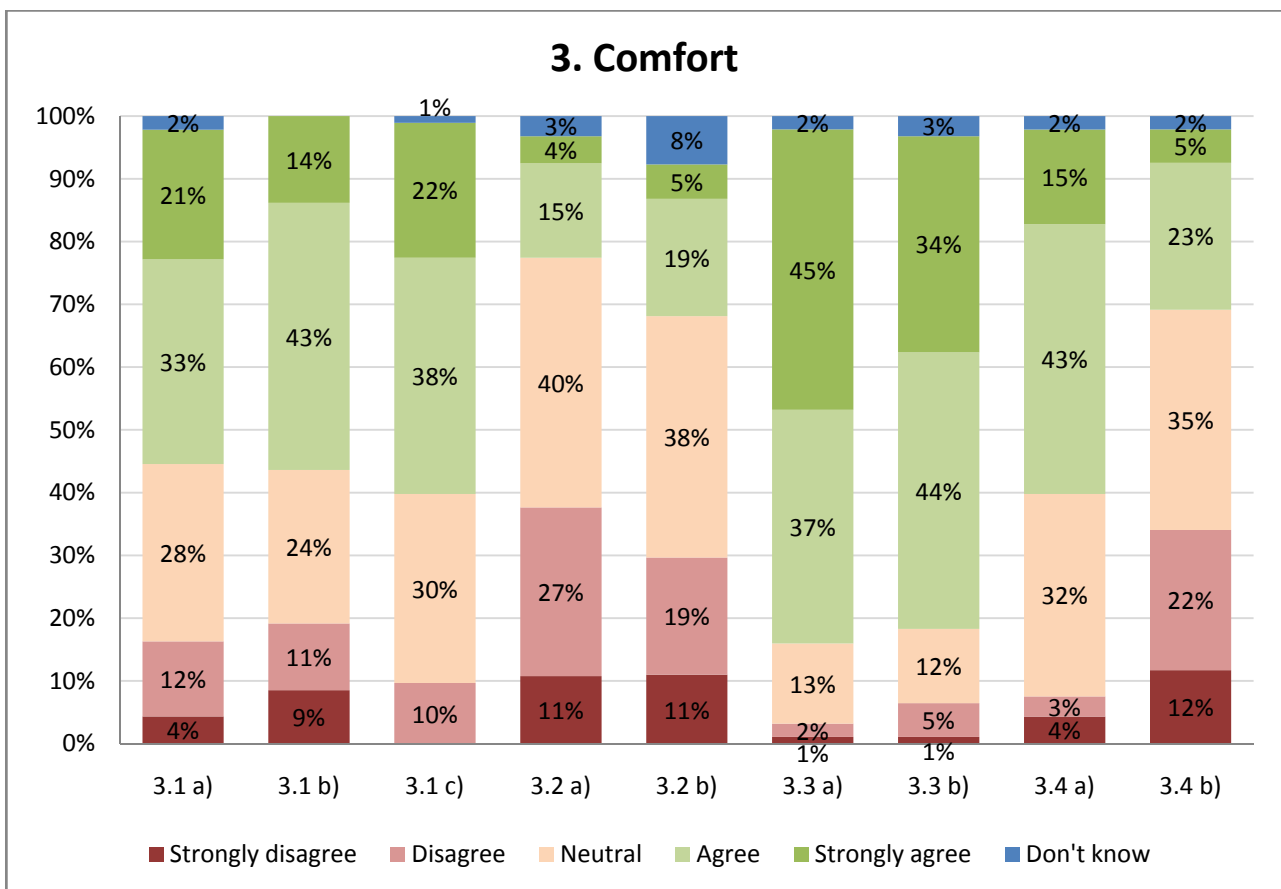
3.4 Furniture

There are **medium results** concerning the question on how to **sit at the desks**.

- a) I can sit at the desks comfortably 58 %

There are **bad results** concerning the **chairs**:

- b) The chairs are comfortable to sit on 29 %

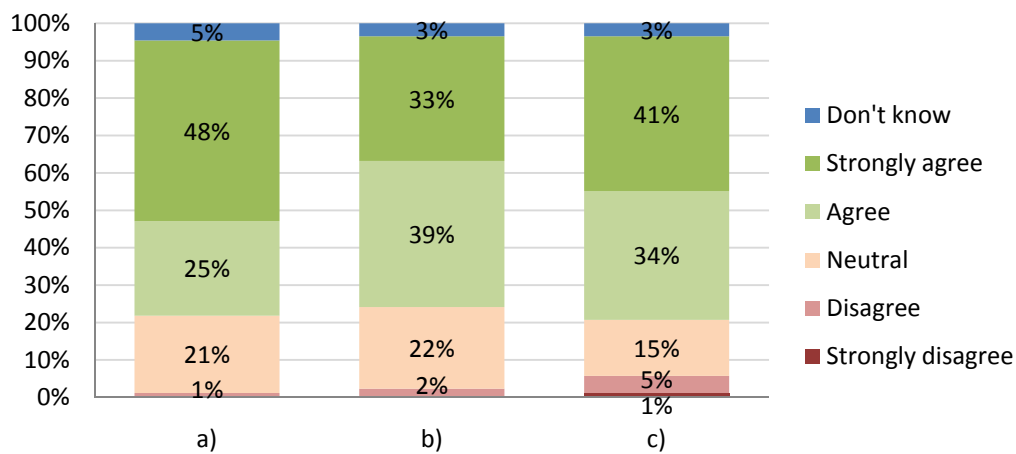


Question 4: School's image

There are **good results** regarding the **external and internal visual appearance** of the school:

- a) The outside of the school buildings is welcoming and attractive 74 %
- b) The inside of the school buildings is welcoming and attractive 72 %
- c) The classrooms are covered in displays of student's work and other decorations, which makes them look attractive 76 %

4.1 School's image

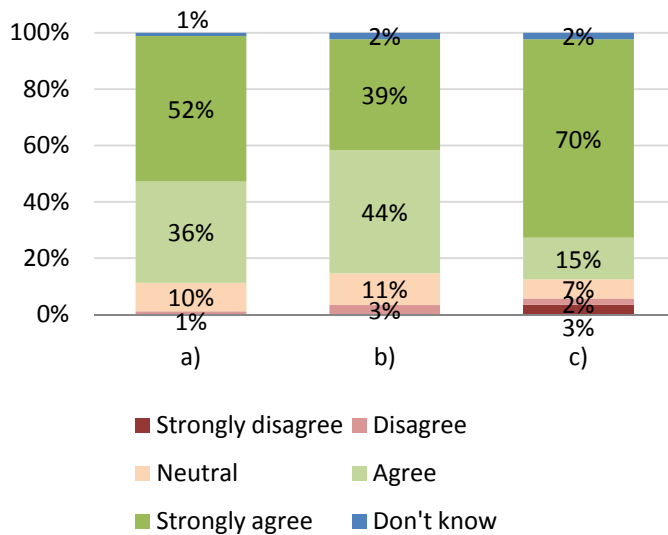


Question 5: Safety and security

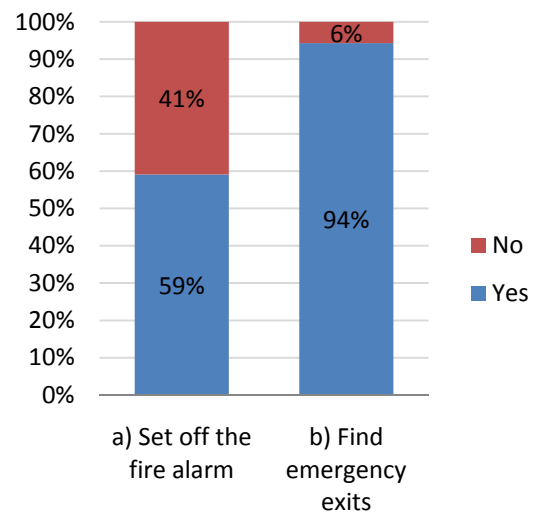
There are **very good results** regarding the **security** on school:

- | | |
|--|------|
| a) I feel safe in the school | 88 % |
| b) I feel safe on school grounds | 83 % |
| c) There are secure lockers in which I can store my belongings | 85 % |

5.1 Safety and security



5.2 Safety - emergency



However, only little more than half of the students answered that they know in case of emergency how to:

- | | |
|-------------------------|------|
| a) Start the fire alarm | 59 % |
|-------------------------|------|

On the other hand almost everyone knows in case of emergency who to:

- b) Find the emergency exits 94 %

Question 6: Maintenance

There are some **medium results** regarding the **cleaning of the classrooms**:

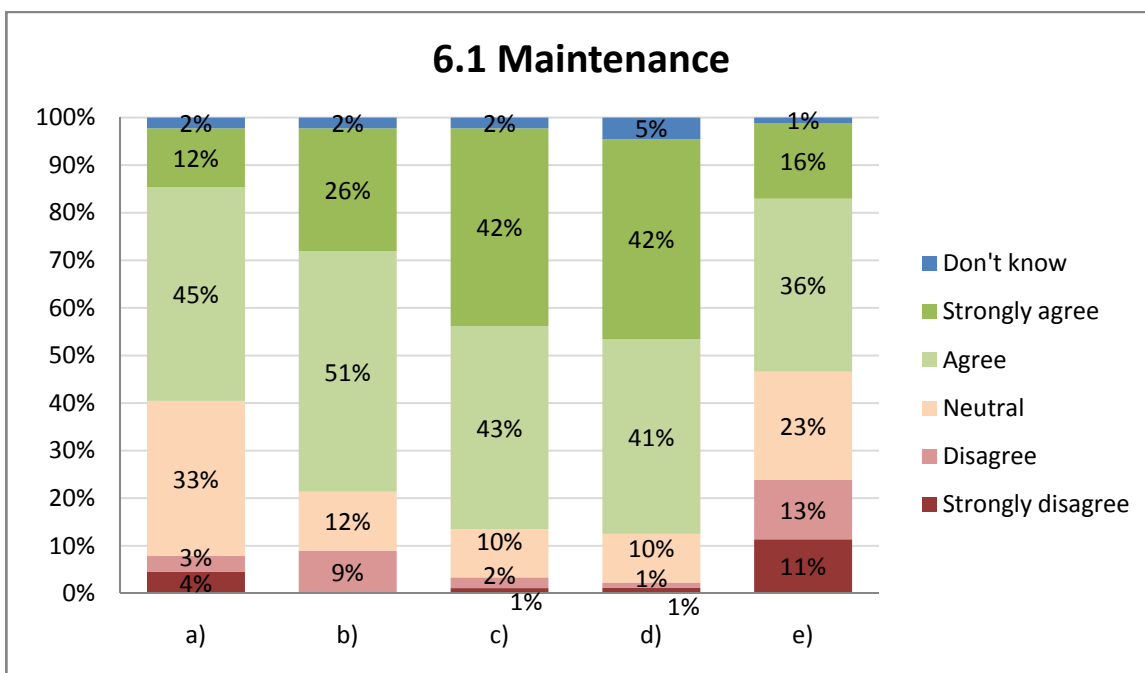
- a) My classrooms are clean 57 %

There are **good and very good results** regarding **other cleaning and maintenance** of the school:

- b) The school buildings and grounds are generally clean 76 %
 c) My classrooms are in good physical conditions 84 %
 d) The school buildings and grounds are well maintained 83 %

Although there are only **medium results** regarding **cleanliness in the toilet spaces**:

- e) The toilet spaces are clean and functional 52 %



Question 7: Environmental sustainability

In general, there was a great uncertainty among the students on how to understand environmental sustainability. This is reflected in the high number of “don’t know” answers.

However, most students believe that the following eco-friendly option is available at the school:

- a) Spaces for separating waste in the classrooms (e.g. paper) 74 %

Then under the half of the students believe that these following eco-friendly options are available at the school:

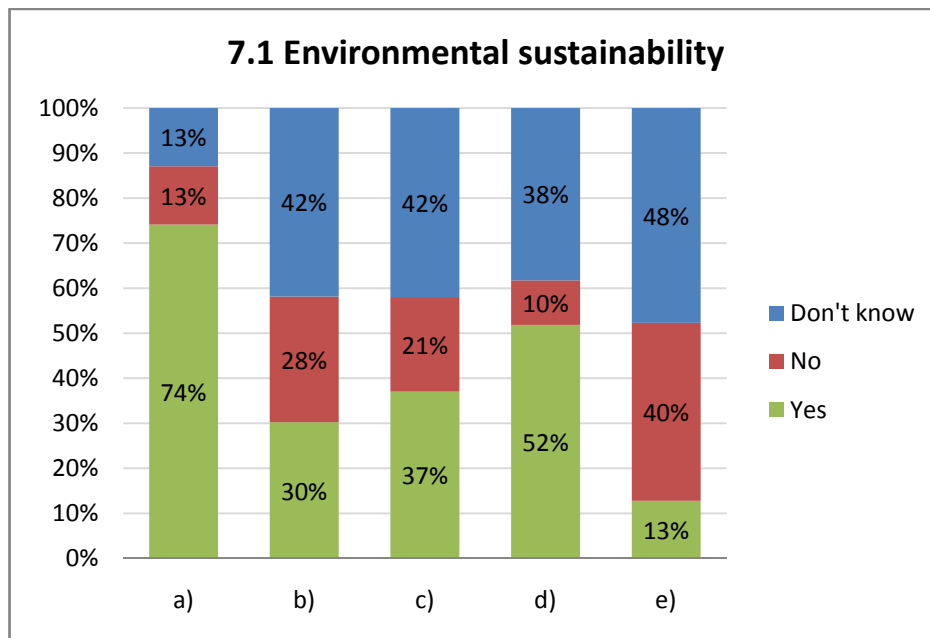
- b) Spaces for separating waste outside the classrooms (e.g. paper, glass, plastic, biodegradables) 30 %
- c) Water saving devices or spaces (e.g. automatic shut off taps, dual flush toilets, rainwater collection tanks). 37 %

A little above half of the students believe that the following eco-friendly option is available at the school:

- d) Energy saving devices or spaces (e.g. motion detectors for lights in classrooms, solar panels) 52 %

Only a minority believe that the following eco-friendly option is available at the school:

- e) Spaces used by the students in lessons (e.g. meters to monitor energy consumption, ecological/horticultural spaces) 13 %



The outcome is however more positive when it comes to questions concerning the efforts for environmental sustainability.

There are **medium results** regarding the **students' interest in making the school more "green"**:

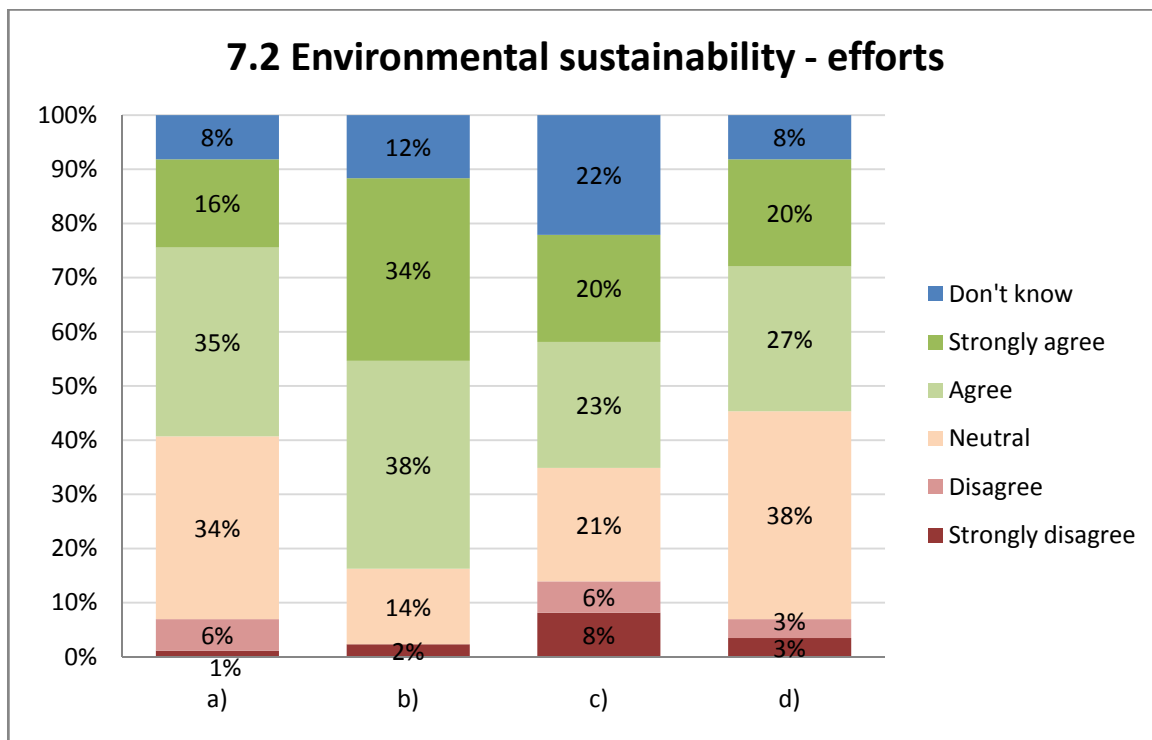
- a) Most students are interested in taking steps to green the school, e.g. reducing the school's negative impact on the environment 51 %

There are **good results** regarding the students' perception of the **teachers' interest in making the school greener**:

- b) Most teaching staff are interested in taking steps to green the school, e.g. reducing the school's negative impact on the environment 72 %

There are only **medium results** regarding the students' perception of the **community's interest in making the school greener** and **their own effort in making their homes greener**:

- c) My community is interested in taking steps to green the school, e.g. reducing the school's negative impact on the environment 43 %
- d) I try to green my home, e.g. reducing my own negative impact on the environment 47 %



Comments

The test was good. I would like to have energy and water saving taps as well as other things that can save CO2.
We have just been elected green profile school
The only bad thing is that we don't have a pent roof to stand under when it's a poor weather. On the other hand we are allowed to stay indoors.
When you are outside and it's raining, it would be nice with a pent roof – but there is none on our school!
We are a green school. Hurrah, hurrah
We are a green school, which SOME like
It's ok
To these questions: How are children in 4 th grade supposed to answer these questions??
I think that the "eat" meals should come earlier
The questions are difficult to understand and strange
The chairs should have back rests

Your online questionnaire was really bad. We were minimum 5 persons, where it kept jumping back instead of forward when we clicked continue
In the 6 th grades' classrooms in building there is a lot of draught in the winter, so we are cold. We think that you could put up a door as they have done in the 4 th grades' rooms. I like the very modern architecture which characterises the school and grounds. The common room is very large and there is often very much noise also during after-school time. One gets very often a headache.
Our school is okay, but something should be done to the unclean toilets.
Our school is okay, but there has to be done something about the unclean toilets.
The school functions okay... Most of the time. The toilets are partial clean, but sometimes there is a lack of soap and the walls are often written upon.
Everything works fine besides the toilets because the walls are written upon and there is a lack of soap/napkins.
We have several buildings so it's cold in the winter if we have to walk to the classrooms for music, needle work, home economics and so on
In the classroom for 6 th .a grade there is a lot of draught in the winter near the door.
I think that the plants (trees, bushes etc.) in the outdoor areas are damaged quickly!

Summary:

- The students are aware that the school has a green profile
- No pent roof / cold to walk from building to building in the winter
- Draught in the 6th graders' classrooms in building 2 in the winter
- Unclean toilets – lack of soap
- Lights on during the night

Teachers' responses

Only 9 teachers teaching students in the 4th to 9th grade answered the questionnaire. Therefore the results cannot be seen as totally accurate, but will be used as indicators.

Question 1.1: Teaching spaces

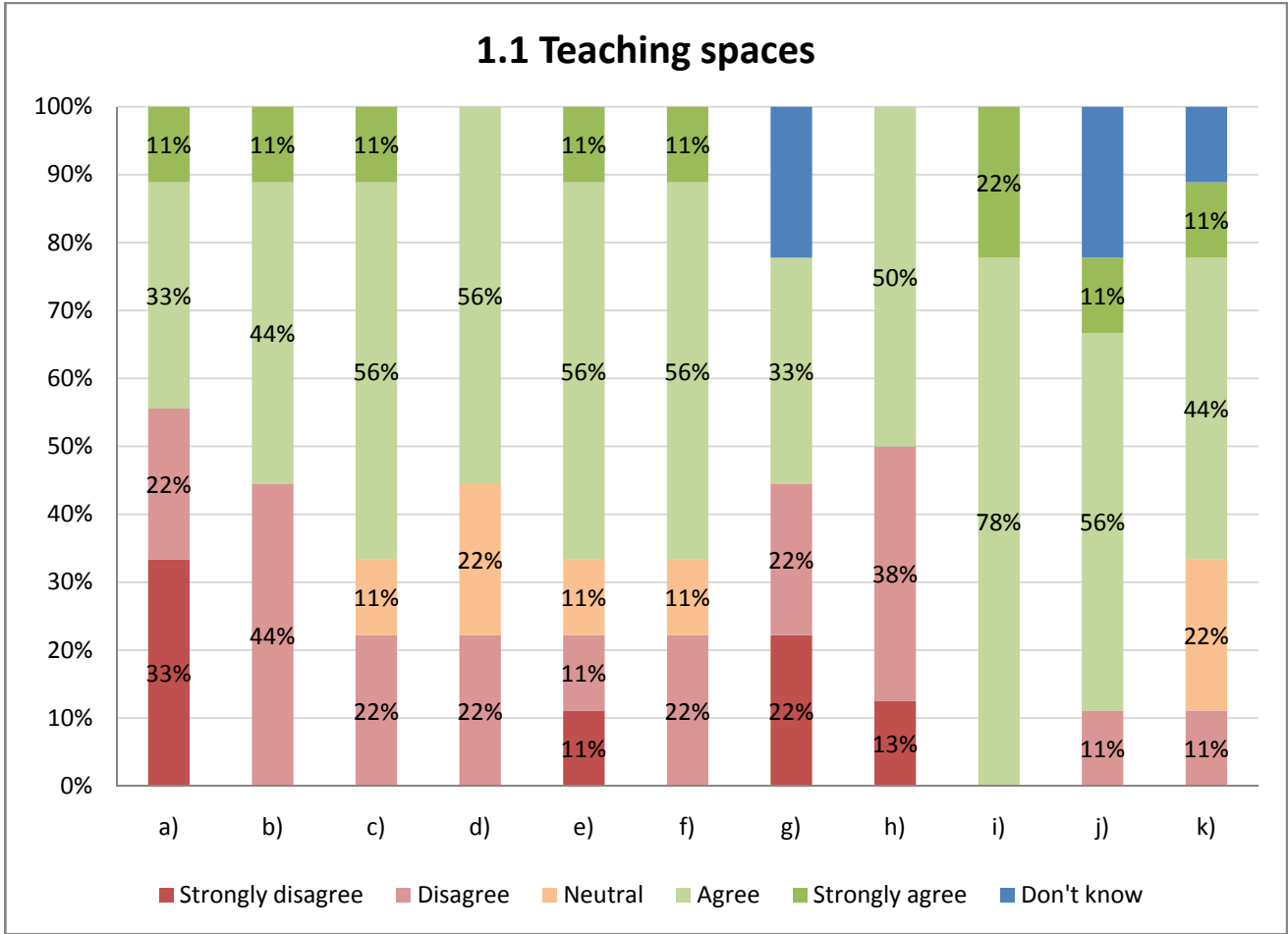
1.1.1. List the spaces that you currently use for teaching

Normal classrooms	The hall
Science classrooms	The pedagogic center
Library	
Common room	
Normal classrooms	Outdoors area
Science classrooms	Common area
Sports hall	The city
Computer room	Classroom for home economics
Classrooms	Classroom for specific topic
Computer room	Normal classrooms
Classroom for home economics	
Classrooms	Pedagogic center
Music room	School kitchen
Normal classrooms	
Classrooms for specific topic	
Normal classrooms	Sports hall
Computer room	Local swimming pool
Small gym	Classroom for needle work
Library	Classrooms for specific topic

1.1.2 Teaching spaces

There are mainly **good and medium results** regarding the **teaching spaces**. But there are **bad results** regarding the **teachers' own space during the lessons**. On the other hand there are some **very good results** concerning the possibilities to use electronic equipment such as **ICT in the lessons**.

a) The spaces in general are large enough to accommodate the number of students being taught	44 %
b) Furniture can be easily moved and arranged to accommodate different learning activities	56 %
c) There are different areas for students to pursue different learning activities	67 %
d) The physical layout of the classrooms allows for new methods and teaching practices	56 %
e) There are areas where students' work can be displayed	67 %
f) There is enough storage space for teaching materials and students' work	67 %
g) There is enough space for me to work at my desk or move around when teaching	33 %
h) Students have adequate access to functioning computers with internet	50 %
i) I can use electronic equipment – such as video projector, DVDs and projection screens	100 %
j) The school is accessible for students with special needs, especially drop-off points	67 %
k) Classrooms are accessible for students with special needs	56 %



Question 1.2: Spaces for teaching staff

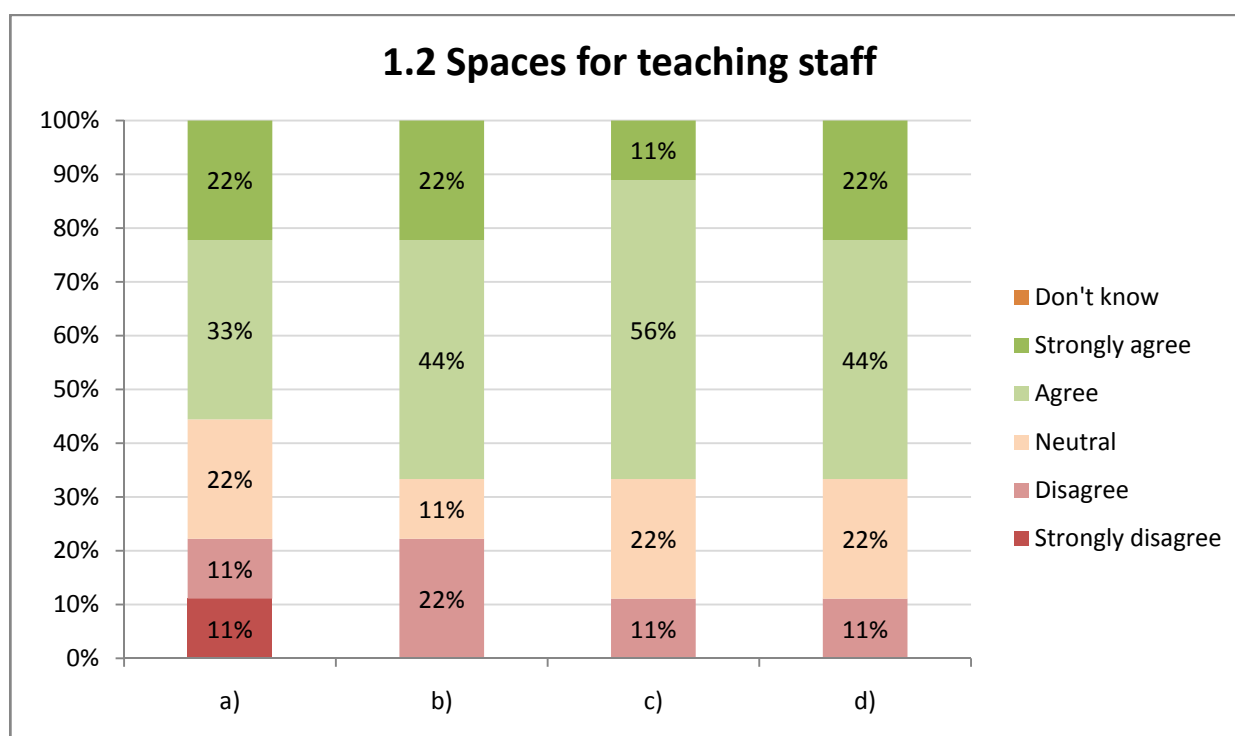
1.2.1. List the spaces that you currently use in the school for completing work outside teaching time such as for lesson preparation, marking, administrative work, staff meetings, etc.

Teachers' common room in building 3
Large staff room
Office
Large staff room
Large staff room
Local teachers' room
Common room
Teaching preparation
Staff meetings
Marking of assignments
Teaching preparation
Staff meetings
Marking of assignments
Large staff room
Small and large common rooms for teachers
Large staff room
The teachers' common room in building 2

1.2.2 Spaces available for teachers on the school

There are mainly **good results** regarding **spaces for the teachers**.

- | | |
|---|------|
| a) There is enough space in the school to carry out work outside teaching time | 55 % |
| b) There is enough space to hold meetings between staff for with parents | 66 % |
| c) There are functioning computers to help me complete work outside teaching time | 67 % |
| d) The staff room is a comfortable area for teaching staff | 66 % |



Question 2: Comfort

2.1 Air quality and temperature

There are medium results regarding the air circulation and the temperature in the winter.

- | | |
|---|------|
| a) The classrooms have good air circulation (i.e. I can breathe easily, it is not stuffy or too breezy) | 44 % |
| b) The temperature in the classrooms is comfortable in the winter | 44 % |

On the other hand, there are some **very bad results** regarding the **temperature in the summer and the operation options**:

- | | |
|---|------|
| c) The temperature in the classrooms is comfortable in the summer | 11 % |
| d) I can control ventilation and temperature in the classrooms (i.e. you can open and close windows; switch on fans, air conditioners or heaters; or adjust the thermostat) | 11 % |

The teachers regard the temperature in the winter roughly the same way as the students, but they assess the temperature in the summer to be much poorer than the students' perception.

2.2 Noise

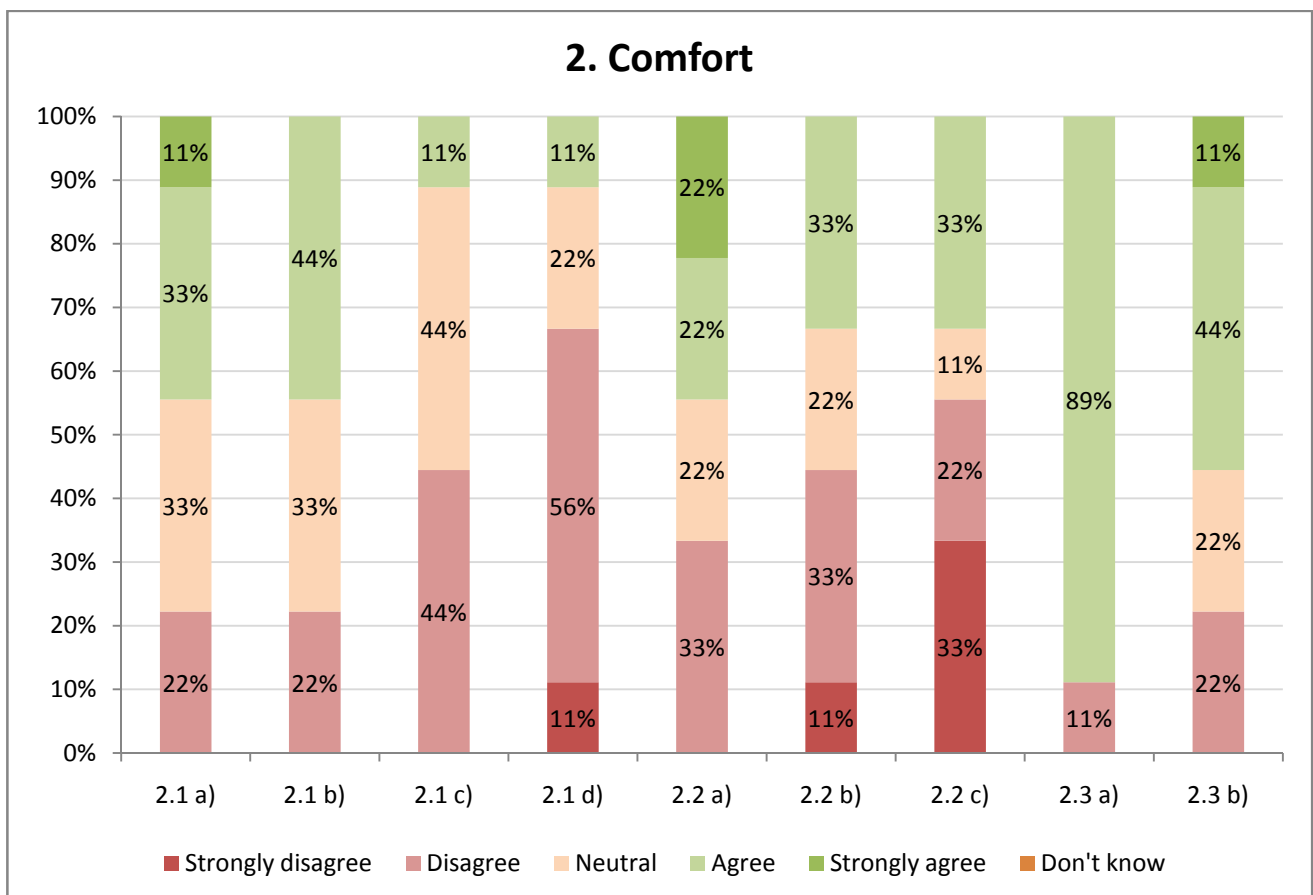
There are **bad and medium results** concerning **noise**. However, it should be noted that the questions on noise are formulated as agreement or disagreement on negative conditions, where other questions are typically formulated as agreement or disagreement on positive conditions.

- a) Sound echoes too much in the classrooms 44 %
- b) (When students are quiet) I have to raise my voice to ensure that students hear me at the back of the classroom 33 %
- c) Noise from outside the classrooms does not disrupt student learning 33 %

2.3 Lighting

There are **very good results** regarding the **lighting levels in the classrooms**, but there are only **medium results** concerning the **operation options**:

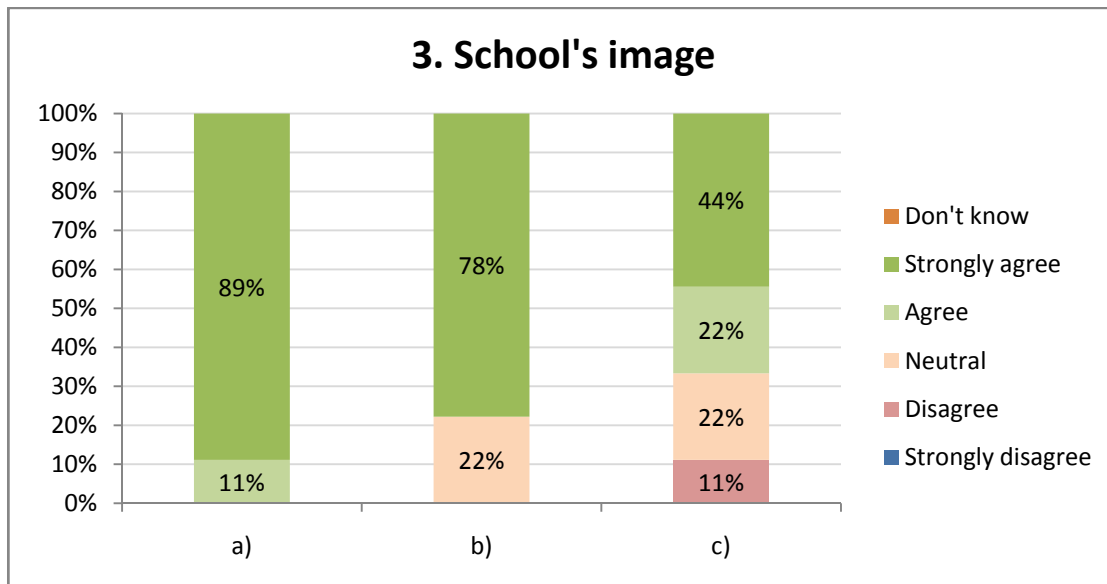
- a) The classrooms have good lighting (i.e. it is not too dark or too bright; there is no glare), so that I can teach and see students and their work without difficulty 89 %
- b) I can control lighting in the classrooms (i.e. you can turn the lights on and off, open and close shutters/blinds to control natural light) 55 %



Question 3: School's image

There are **good and very good results** concerning the **school's image** as well as full agreement that the outside of the school buildings is welcoming and attractive.

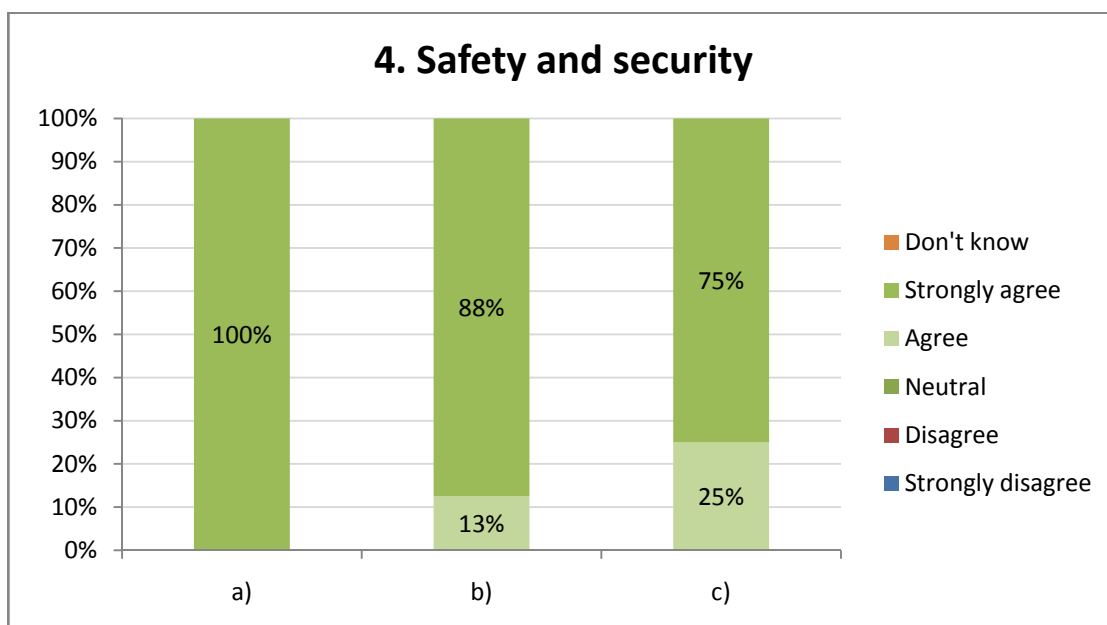
- | | |
|--|-------|
| a) The outside of the school buildings is welcoming and attractive | 100 % |
| b) The inside of the school buildings is welcoming and attractive | 78 % |
| c) The school buildings convey to the community the importance of learning | 66 % |



Question 4: Safety and security

There are **very good results** concerning **safety**.

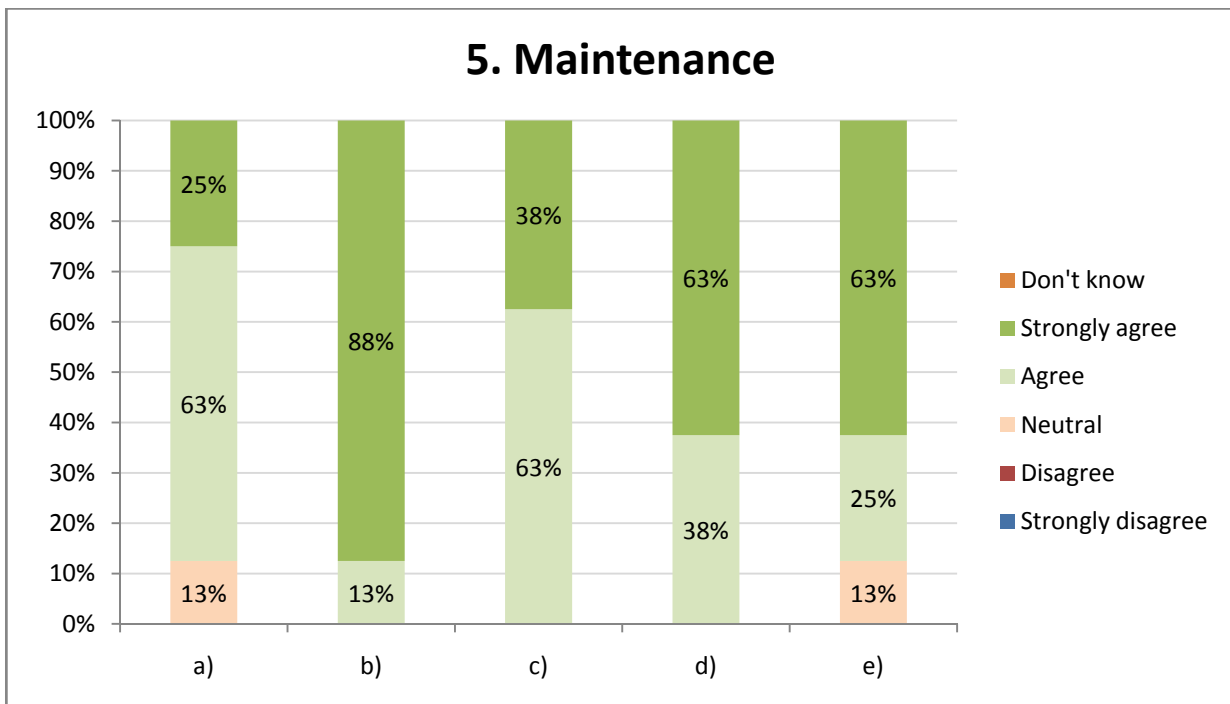
- | | |
|---|-------|
| a) I feel safe in the school | 100 % |
| b) I feel safe in the school grounds | 100 % |
| c) There are secure lockers in which I can keep my belongings | 100 % |



Question 5: Maintenance

There are **good and very good results** regarding **cleanliness and maintenance**.

- | | |
|--|-------|
| a) Classrooms are clean | 88 % |
| b) The school buildings and grounds generally are clean | 100 % |
| c) Classrooms are well maintained (i.e. wall paint and floor coverings are in good condition, windows and doors function correctly and the ceiling does not leak) | 100 % |
| d) The school buildings and ground are well maintained (i.e. wall paint and floor coverings are in good condition, windows and doors function correctly and the ceiling does not leak) | 100 % |
| e) The toilet spaces for staff are clean and functional. | 88 % |



Comments

The scientific area: There is a constant background noise from the exhaustion; the air in these rooms is very dry; it's a pity there is not gas taps in both rooms; there is very little room for sliding board; cable stands and other movable objects should be placed against a wall or other places where they are not an inconvenience.

The loft: It's almost impossible to teach there, because the noise levels from others students

Language rooms: are very small because of the small group rooms (which are often messy since students hide in there).

There are missing explanations to many of the phrases in the questionnaire. Fx what is a drop-off point?

Since the school is new, it's hard to answer most of the questions negatively.

The school has open spaces – you can't close the door. This gives commotion from the common area etc.

Summary:

- Noise from hallway and common room
- Open spaces makes noise worse

Focus group, interviews and observations

Focus groups and interviews

It was difficult to make real focus groups since the teachers in particular were reserved. Therefore we did not succeed in having a focus group consisting of teachers. Instead, interviews of a few teachers and students were conducted.

Interview of two students from 6th grade

A short interview was conducted of two students from 6th grade during a lesson.

Noise: The two students thought that there is a lot of noise in the school buildings. They even said that there have been discussions about this among the classes, which resulted in a campaign to make the students to quiet down in the hallway and common area. So they made a quiet room with notes implying students to be quiet.

Maintenance: Groups of students are made to tidy up after the other students. If not, all students will have to do extra cleaning and in some cases the cleaning staff will not clean.

Indoor environment: The two students confirm that there is a draught in the 6th graders classrooms as noted in the questionnaire especially in room 6.b, a more closed room than the others. However, they do not believe that the draught is coming from the opening of windows since they do not think that there is any ventilation on that side of the building.

Focus group – students from 8th grade

The group consists of 8 students from 8th grade, whereof over half are girls.

The group was posed the question on what they would suggest of improvements that will improve learning, if the mayor of Copenhagen Frank Jensen offered to invest 1 million kr. in the school buildings.

Suggestions for improvements:

- More classrooms
- Screen enclosure of common room
- Screen enclosure of classrooms towards the common area and hallway
- A solution on how to reduce the large temperature fluctuation
- Fixed classroom for each class and year

Green profile: “How does the school’s green profile play in on your weekday here at school?”

Some of the students think that other ordinary schools have more natural science courses than Utterslev School and that their courses come in waves. However, two of the students think that there is a greater focus on natural science in the smaller classes than in their year. The smaller classes are especially taken into consideration during the natural science week, which can be demotivating for the older students. Never the less the students in the focus group do sense the green profile at school especially during the COP15 summit in December 2009, where climate delegations consisting of students from other countries visited the school as well as student group from Utterslev School participated in a summit meeting for children and young in Forum arena.

Noise: The group agree that there is a lot of noise and that most of it comes from the students themselves. They said that there has been a discussion on noise problems at the school where after they came to a solution to put sound absorbing screens up in the common room. But this was quickly dropped because the screens were too expensive. The focus group think furthermore that it would be a great idea to have separate sections within the school buildings by putting walls up like in building 3.

Maintenance: The students agree that the building for the smallest classes (building 1) is very worn down compared to their school building (building 3). But they experience that the interior gets repaired quickly while it takes a longer time for the outside maintenance. Even though it is the first month with the “dukes” scheme, where it is now a whole class having to tidy the common area instead of groups of students from different classes, it seems to work better now than before.

Security: There is generally a great sense of security amongst the students, which might be caused by the division of the three school stages (building 1-2-3). That means that the smallest classes are separated from the older students and thereby prevents bullying among these to some extent. There has been some vandalism on the school and school grounds for a while, but is now eased. The students believe that there are both pros and cons by being so open to the community.

Pros:

- Common room/area (strengthen the social environment)
- Good to shift between classrooms – to work project oriented

Cons:

- The windows are too big – too much sunlight in the summer
- The mechanical opening of windows (natural ventilation)
- A lot of noise because of open spaces and high ceilings
- Lack of space when having to do group work

The students explain that the group rooms are not really used and now the loft in their building is a restrained area because of previous vandalism there. All activities on the loft are only allowed accompanied by a teacher.

Interview of a teacher from building 2

The teacher helped the 4th graders with answering the student questionnaire and she has also answered the questionnaire for teachers herself. The experience was that the students from 4th grade, which were the youngest responders, had difficulties with understanding some of the questions. This concern among others question 1.1 on accessibility (signing etc.), 3.1 on comfort and 7.2 on efforts for environmental sustainability.

Regarding the students’ responses to question 3.4b on chairs she mentioned that they have round stools which can be stacked and easily be placed in different formations, but are not comfortable to sit on for a longer period of time.

The biggest problem with the learning environment is noise. The classrooms were originally more open and have now been closed partially of some places with glass walls towards the common area. But there are still open between the classrooms, so the noise problem is still there.

A proper room for arts is missing. There is a small room in building 4 where they have the creative subjects, but this room is functional so she uses a normal classroom for arts.

Furthermore she mentions that some people wonder why there is no heating in the large common room where the students sit directly on the concrete floor. They have tried with mats, but it is difficult to avoid having the mats lying everywhere.

Interview of a teacher in building 3

There are 3 fixed teachers per year. The two classes per year are taught crosswise with shifting divisions after motivation and who is prepared. There is a new schedule every 10th week, which is send with the weekly letter.

The weekly assigned group of students has the responsibility to clean the tables, empty the garbage cans and put the tables back in place in the common room after lunch break.

In building 3 differs from building 1 and 2 with a wall separation in the one side of the building between 2 classrooms and the common room. The extra wall was put up during a former occupation of the building by a special school. This section is used by the 9th grades only and is thereby screened off for noise especially from the loft area.

This school year is the first with 9th graders and the school building 3 is thereby fully used now. However, the usage of classrooms is not that well developed yet as the usage of building 2.

The pedagogic idea behind the school's design is project oriented teaching and all the teachers are interested in working that way. Though students in between being special and non special students (special students meaning students with learning difficulties) have a hard time with this approach. The students do not have their proper classroom. Originally the school was thought as having all classrooms as specific subject rooms, but this was not carried out and would doubtfully have been the right solution.

The division of classrooms is planned on ad hoc basis among the teachers. In some rooms there are smart boards (interactive blackboard), so those teachers needing these boards have the say in the room division.

Noise: Some rooms are problematic. Small rooms are used poorly and can therefore cause people to use the common areas for teaching, which means many disturbances. Some rooms cannot be used sufficiently and cause a lack of space. For the 9th graders the open spaces function well, but some boys in the 8th grade have difficulties with the open spaces. However, it is difficult to screen these rooms if for example the class next door is showing a movie. This disturbs the teaching and class is moved someplace else.

Maintenance: There are some small "vandalisms" in building 3, which is quickly repaired. Additionally the cleaning of classrooms and common area is good.

Indoor environment: She does not think much of the indoor environment, but says that many feel that it is cold and are often bothered by the mechanical openings of windows. Furthermore it gets quite hot during the summer because of the large windows and no real external solar screening. She thinks that the pergola does not screen at all. She is additionally unsatisfied with automatic control of the natural ventilation system.

Work spaces: There is generally a lack of quiet workplaces in particular during school hours. The work spaces are often disturbed by other teachers. There are just enough spaces since they are a full teaching staff. It will become a bigger problem when the school expands to three classes per year this summer.

Pros:

- The students work constantly project orientated, which requires self-dependence
- Better social time together and network across classes
- The best room in building 3 is closed with space for two classes and partial division between them
- The common room functions really well at the morning gathering – potential use of big screen

Cons:

- The building is not suited for class teaching – lack of space
- The building design does not regard children, who need more structure (e.g. more closed rooms)
- Classrooms fixed as subject rooms is a problem for the usage – lack of rooms

Observations

Morning gathering, Wednesday the 3rd of February 2010 8.20-8.40am

Place: The common room in building 2

Frequency: Daily

Present: Students from 4th and 6th grade. The 5th graders meet later because of swim practice

Use of space: The younger students sit on the floor in the middle of the room, while the older sit on 3 level benches in the back. The teachers stand or sit around the room or with the students. The teacher responsible for today's morning gathering stands in front of the students. Another teacher plays the piano in the corner near the teachers' common room during the first community singing and then the CD player in the kitchen area during the second community singing.

Procedure: The gathering was delayed because of snowy weather – some students and teachers are late. The responsible teacher calms everybody and talks about snow as a present subject. He asks the students what snow consists of and tells about how snow is formed from water and air. During the first community singing he gets a bucket of snow and makes a contest, where students have to guess the amount of melted water there will be the next morning. There will be a prize to the best class.

The pile with forgotten clothes and shoes etc. is presented and handed out. Then there is the second community singing, where many of the students do not sing along even though they have songbooks. They go over today's schedule. The 4th graders start with sports while the 6th graders will have creative subjects. A teacher announces that there will be a short student council meeting at 9am in building 5 and members from the 4th grade can come in their sports clothes. The responsible teacher asks if there is any birthdays today, but there is not. The head master Geert Hansen presents us and our study and says that we will be on school today to observe how they use the buildings as well as talk with some students and teachers.

Start up on the creative subjects for the 6th graders, Wednesday 3rd of February 2010

All the students are gathered together with their three teachers in a class room that is open out to the hallway and partially open to the neighboring classroom. There is a bare patch of floor in the middle of the room and different furniture such as benches, bunks and tables. The teachers stand next to a whiteboard. One of them tells the students that they are to be divided into 3 groups working on respectively needlework in the pedagogic centre, home economics (i.e. in the cantina kitchen) and woodwork (i.e. in building 4). The teachers want to put up posters of the subjects and the list of groups on the whiteboard, but there are only magnets for the posters. A teacher calls out the names for each group, where after the students and teachers leave the classroom.

Building 2 is almost deserted except for the far end of the building, which is used by seemingly preschool children. This reflects an inexpedient usage of the building, since it would be more appropriate to spread the occupancy of the building more efficiently. This would also minimize the noise levels.

Needlework 6th grade, 8.55-9.30

The needlework class takes place in the pedagogic centre by the computer area. There is here a little space in front of the projector and a smart board (interactive board), where the 15 students can sit while today's project is presented. The project is about the environmental impact from plastic bags. So the purpose is to make fabric bags with their own designed logo in groups of two students. First they have to design the logos, so they will have to use the computers in this lesson.

Specific observations:

- There is a faint background noise from the entrance to the school office on the first floor
- Quiet area – no real disturbing elements
- There is a good flow between project presentation and use of computers
- The pedagogic centre is used well for this type of teaching

Comfort and storage

	Excellent	Good	Fair	Poor	Comments
Availability of space	X				
Lighting		X			
Acoustic control			X		
Ventilation			X		
Temperature		X			
Cleanliness			X		<i>Too messy</i>
Maintenance	X				
Furniture quality		X			<i>More stools than chairs</i>
Availability of storage space			X		
Use of storage space			X		

Flexibility and equipment

	Yes	No	Not sure	Comments
Moveable furniture		X		<i>Fixed places for computer tables</i>

(desks and chairs)				
Moveable partitions	X			<i>Bookcases work as partitions</i>
Other flexible features		X		
Availability of ICTs	X			
Use of ICTs	X			
Availability of other equipment	X			<i>Interactive board – “Smart board”</i>
Use of other equipment	X			<i>Use of smart board in presentation</i>
Dedicated educational spaces for different learning activities	X			<i>The centre has multiple functions – library, specific learning environments</i>

Access

	Excellent	Good	Fair	Poor	Comments
Access to other classrooms				X	<i>Centre is placed in the administrative building</i>
Access to classroom from corridor			X		
Access to personal space		X			
Access to storage space		X			
Access to external space		X			
Access to emergency exits	X				
Access for students with special needs		X			

Morning gathering, Friday the 5th of February 2010 8.20-8.40am

Place: The common room in building 3

Frequency: Daily

Present: Students from 7th, 8th and 9th grade.

Use of space: The students sit in a half circle on chairs, benches and some on the floor focused on the kitchen area, where the responsible teachers use a big screen located on a wall above the kitchen. Another teacher uses the piano next to the kitchen area. The other teachers stand behind the students.

Procedure: The responsible teacher calms the students and they begin with a community song. Thereafter several birthdays are announced and they sing a birthday song. The head master Geert Hansen informs of the photographer from Danish Teacher Association who visited the school the day before and then shortly presents us. Then the responsible teacher shows a presentation on the big screen of charity songs about hunger in Africa, the Balkan war and Danish soldiers in Afghanistan. Two teachers have further messages to the students and the responsible teacher goes over today's schedule written on a whiteboard. The class responsible for tidying the common area this week is also written on the board. The morning gathering ends with the students putting the furniture back in place.

Class time with the 8th graders, Friday the 5th 11.30-11.50am

The lesson starts with both classes gathered together with two female teachers in a classroom (approximately 60m²) called the Blixen. One of the teachers introduces the program for the lesson (90 minutes). The room is furnished with rows of tables and chairs in the middle as well as tables and chairs lengthwise the walls.

There is also a projector, but is not used this time. About 50 students sit tightly together on the tables and chairs. After the introduction the students are divided into gender because the teachers want to discuss different problems with each group. The boys go with one of the teachers to the loft, while the girls are left behind with other teacher.

Class meeting- girls in the 8th grade, 11.50am-12.30pm

The girls sit in the classroom in a circle together with their teacher. It gets calm rather quickly after the boys left. For every class meeting there is an agenda set by both students and teachers. This time the girls are going to discuss unity and especially groupings among the girls in 8th grade.

The classroom is open to two sides, where it is tried to close off with shelving units. However, there is still noise coming from the hallway and entrance. The girls seem aware of this and have a hard time saying something private as it can be heard by other students in the hallway. This makes to the students hard to hear even within the circle.

The classroom itself does not look as if it is used regularly since there are only a few personal items in the room and on the walls and books are placed at random places. There are white curtains and some quite translucent blinds used as solar screening.

Comfort and storage

	Excellent	Good	Fair	Poor	Comments
Availability of space			X		
Lighting		X			
Acoustic control			X		
Ventilation			X		
Temperature				X	<i>Draught from hallway</i>
Cleanliness			X		
Maintenance		X			
Furniture quality			X		
Availability of storage space				X	
Use of storage space				X	

Flexibility and equipment

	Yes	No	Not sure	Comments
Moveable furniture (desks and chairs)	X			
Moveable partitions	X			
Other flexible features			X	
Availability of ICTs	X			
Use of ICTs		X		
Availability of other equipment	X			<i>Interactive smart board</i>
Use of other equipment		X		
Dedicated educational spaces for different learning activities		X		

Access

	Excellent	Good	Fair	Poor	Comments
Access to other classrooms		X			
Access to classroom from corridor	X				
Access to personal space			X		<i>Lockers in hallway only</i>
Access to storage space				X	<i>Very little space in classroom</i>
Access to external space		X			
Access to emergency exits		X			
Access for students with special needs		X			

Class meeting – boys in the 8th grade, 11.50am-12.30pm

The 19 boys sit in U shaped form in the one end of the loft with low couches and bunks. The teacher sits on a chair in the middle with a good eye contact with the group and introduces the issues with some unfortunate incidents, vandalism and untidiness that many have experienced and the students' lack of will to take responsibility. During this process there is a lot of commotion amongst the boys and also noise coming from below. The noise levels get even worse when other students start using the computers at the other end of the loft.

The boys sit close together and some bother each other and others talk among themselves. The teacher tries persistently to have a dialogue with the boys and starts a round of questions to get them to respond. One student sits for a while on the lap of the teacher. At the end of the class meeting they have not come to any results and the teacher concludes that the subject should be taken up again another day. As a finishing remark the teacher says that next time they are not allowed to sit on the couches.

The boys go back to the classroom "Blixen", where the girls are putting the furniture back in place. The next half hour they will have regular lesson.